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TITLE

A Case-Comparison Study Protocol for Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County

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ABSTRACT

Introduction: Impoverished neighborhoods and communities of color often bear the brunt of unintended transit-oriented development impacts. These impacts have been known to come in the form of transit-induced gentrification (TIG), a socioeconomic by-product of transit-oriented development defined as a phenomenon that occurs when the provision of transit service, particularly light rail transit (LRT), "up-scales" nearby neighborhood(s) and displaces existing residents. Consequently, TIG or even the perception of TIG can impact health outcomes (e.g., anxiety) and social determinants of health (SDOH) (e.g., crime).

Methods/Analysis: In 2022, the Purple Line (PL), a 16.2-mile LRT line, is opening in Prince George's County, Maryland, a suburb of Washington, D.C., comprised of over 80% African American and Hispanic residents. By taking advantage of this natural experiment, we are proposing the GENTS (Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County) Study in order to evaluate perceived TIG and associated health outcome and SDOH changes, at two points in time, among Prince George's County adults in a prospective case-comparison design during the pre-PL LRT period. Latent growth curve modeling will be used to examine these changes over time.

Ethics/Dissemination: Ethics approval has been granted by the University of Maryland Institutional Review Board. The GENTS Study will identify changes over time in perceived TIG, health and SDOH among case and control residents before the completion and operation of the PL LRT, an under researched period of transit-oriented development. The dissemination of GENTS Study findings will be able to address research questions and policy issues that are specifically tailored to PG County while also providing more effective policy solutions for other regions undergoing transit-oriented development.

STRENGTHS AND LIMITATIONS

- This study is the first to prospectively investigate the relationship between gentrification perception and health using a longitudinal research framework at the neighborhood level.
- This natural experiment is one of only a few to investigate the relationship between perceived gentrifcation, health outcomes and social determinants of health in a community of color
- This study did not have a follow-up period. We intend to perform this examination in the coming years.
- In light of the COVID-19 pandemic, this study will primarily rely on the online environment for the recruitment of participants.

INTRODUCTION

Transit-Oriented Development in the United States

Although environmental justice is a movement addressing economic and health impacts of environmental inequality and racism, it also serves as a foundation for understanding why poor neighborhoods and communities of color often encounter transit inequities and bear the brunt of unintended transit-oriented development (TOD) impacts[1]. TOD has been introduced by city planners and designers as a solution to a variety of urban problems, such as energy dependence, urban poverty, land consumption, traffic congestion, and public health challenges. TOD initiatives serve as powerful tools for improving the quality of life by reducing automobile dependence and increasing accessibility to employment and other transit destinations. Emerging as a popular and influential planning concept, TOD includes a mix of commercial, residential, and entertainment properties centered around or located near a transit station[2]. In an effort to create walkable, dense, mixed-use, and connected communities, TOD is an integration strategy for public transportation investments and land-use practices[3]. Therefore, TOD projects have increased in number over the past few decades with the rapid expansion of rail transit, particularly light rail transit (LRT) systems, in cities throughout the United States, such as Atlanta, GA; Detroit, MI; Milwaukee, WI; Charlotte, NC and Salk Lake City, UT [3, 4]. As a function of TOD growth, LRT use increased in passenger miles by 280% from 1990 to 2010 in the United States[5, 6]. LRT is characterized by electric trains running along fixed routes with dedicated track corridors and passenger boarding stations[7]. With smaller cars than commuter trains and traffic signal priority to ease efficiency, LRT has greater utility for implementation in densely populated metropolitan areas[8, 9]. For many reasons (e.g., mass transit expansion, urbanization), LRT and overall public

transit use has increased among Americans and tends to be higher among African Americans, Hispanics or immigrants[10, 11].

Economic and Social Impacts of Transit-Oriented Development

TOD creates conditions for private investments, newly-built developments and higher accessibility. Several studies have characterized TOD outcomes as promoting economic development, elevating property values, and enhancing livable environments[12-16]. For example, research examining the housing premium associated with TOD in San Diego, CA found that a condo in a pedestrian-oriented environment and near a TOD, specifically a LRT station, had a significantly higher value than a condo in a similar neighborhood and not near a LRT station[14]. In an effort to rationalize wide-ranging results of empirical estimates, a meta-analysis using data drawn from twenty-three studies found that the price of properties near LRT increased by 8% and reached an upper limit range of 40%[17]. Another study also found that the proximity to Phoenix, AZ LRT stations has a significant impact on housing values even before the actual LRT operations[18]. Furthermore, health and well-being benefits have been positively associated with TOD and specifically LRT use. This has included reduced traffic crashes and air pollution emissions, increased physical activity through active transportation, and improved access to medical care and healthy food options[16, 19, 20]. Along with these positive benefits, the negative impacts of TODs have also been recognized. Neighborhood and equity advocates have expressed concern that new TOD projects will lure wealthier and less diverse residents, which will lead to the displacement of existing populations, a phenomenon known as transit-induced gentrification (TIG)[21]. TIG, a TOD socioeconomic by-product, is defined as a phenomenon whereby the provision of transit service, particularly LRT, and associated area of development change in the

direction of neighborhood "upscaling"[22]. The role of LRT investments in triggering gentrification and displacement of low-income households has been examined in several cities throughout the United States, such as Portland, OR and Denver, CO[23, 24]. For example, the median household income increased by 10% in Denver, CO neighborhoods near LRT stations and from 1990 to 2000 the housing values increased approximately 25% for those located within a mile from a LRT station [23]. During this same time period of 1990 to 2000, the negative impacts of TOD, specifically with the introduction of LRT stations, in 42 neighborhoods within 12 metropolitan areas that were first served by rail were observed through analysis[25]. While there was no fundamental change in neighborhood racial composition, rapid rises in rent and owner-occupied units were found, which resulted in more expensive housing stock, wealthier residents and increased vehicular ownership[25]. With rising property values and loss of affordable housing, displacement, social loss (e.g., disruption of neighborhood social networks) and segregation have been documented as unfavorable TIG externalities, particularly in transit station neighborhoods, which can impact current residents of the TOD[12, 22, 23, 26-32]. Furthermore, social polarization, or rather the splintering of a group into distinct sub-groups that are positioned on different ends of a spectrum (e.g., rich vs. poor), can emerge as a byproduct of real-estate fluctuations and displacement[26].

Consequences of Perceived Transit-Induced Gentrification

PHYSICAL HEALTH CONSEQUENCES

In many low-income areas and communities of color, new transit investments are met with mixed reactions among current vs. new residents or among residents who stay vs. those who leave. In addition to the aforementioned negative impacts, TIG can engender health consequences when

built, and social environments are rapidly transformed[21]. Studies have found that populations displaced by gentrification, as compared to those who remained, typically have a shorter life expectancy, higher cancer rates, more birth defects, greater infant mortality, and higher incidence of asthma, diabetes, and cardiovascular disease (CVD)[27, 33-43]. In one study, hypertension, one of the strongest risk factors for CVD, was inversely associated with neighborhood affluence/gentrification (OR=0.7; 95%CI: 0.6, 0.9)[42, 44]. However, in another study, the risk of displacement was positively associated with hypertension (PR=1.25; 95%CI: 1.08, 1.46) and hypercholesterolemia, another risk factor for CVD, (PR=1.12; 95%CI: 1.01, 1.24) among a population of Hispanic renters in Chicago, IL; Miami, FL; New York City, NY and San Diego, CA[45]. It was also found that the perception of neighborhood problems and changes were strongly associated with more smoking and hypertension in another cross-sectional study[46]. These findings on displacement risk and neighborhood perception shed light on the potential significance of perceived TIG, the perception of adverse neighborhood changes among residents, and its impact on the health of current residents regardless of whether they stay or leave their neighborhood. Changing variables, such as proximity to transit stops, housing type, education levels, population density, as well as, cultural phenomena can all be indicators of TIG progress. To further recognize the latter, cultural displacement, another aspect of gentrification that is often underappreciated, refers to class- and race-based changes in amenity types, such as local establishments. Chain stores and restaurants often instigate a loss of cultural identity and sense of the place in neighborhoods populated predominantly by the people of color. In Portland, OR long-term African American residents experienced a profound change and alienation from new retail spaces on a gentrifying commercial main street [47]. Unlike other social and economic processes, TIG often takes on specific dimensions locally or regionally, and therefore a universal measurement of

TIG is highly improbable[48]. Perceived TIG, such as through the observation of increasingly more affluent residents moving into the neighborhood or through the presence of more police surveillance, can impart negative health outcomes primarily due to the unknown of "if" and "when" "it" (e.g., rent increase leading to a forced eviction/move) will happen.

MENTAL HEALTH CONSEQUENCES

Mental health outcomes, including an increased risk of psychological stress levels, anxiety and depression, have also been demonstrated among displaced populations[27, 33, 35]. The mental health impact related to social loss or the disruption of long-time residential ties and the sense of community diminishment could deteriorate a neighborhood's resilience by weakening social networks[32, 49, 50]. Fear of displacement can heighten anxiety and result in increased mortality[35, 51]. High residential turnover and disruptive impacts of resettlement have been found to be negatively related to lower self-rated health due to the loss of gathering spaces and institutions. Also, displaced residents have reported higher levels of anxiety due to changes in neighborhood character, feeling unwelcomed, and social isolation, all likely due to a loss of community[52-55]. Specifically, sense of community, a social psychology concept, is defined as a sense of belonging both on a geographical (e.g., neighborhoods) and a relational (e.g., human relationships) scale[56, 57]. This concept, which leads residents to perceive and associate a strong identity with a particular setting, has been found to be an integral contributor to one's neighborhood commitment, involvement, and satisfaction[56, 58]. Leveraging findings from the psychology of place research field, it can be theorized that when the four basic sense of community elements ((1) membership; (2) influence; (3) integration and needs fulfillment; (4) shared emotional connection) are threatened by displacement, anxiety and depression may ensue[31, 59]. For example, in a cross-sectional study examining the impact of residential displacement on mental health within

gentrifying and non-gentrifying neighborhoods from 2010 to 2014, displaced residents were more likely to be diagnosed with mental health-related conditions (37% vs. 18%) compared to residents who were not displaced[35]. Another study showed that the stress of displacement among incumbent residents resulted in poor mental health, including anxiety and depression for 84% of men and 91% of women in a gentrified neighborhood[60]. In a repeated cross-sectional study, worsening neighborhood perceptions were associated with small increases in depression[61]. Again, perceptions were found to impart a negative health outcome. It is not well known if these mental health outcomes, or even increased CVD risk, are more likely to occur among current residents with poor or good health.

Social Determinants of Health Consequences

The relationship between TIG perception and social determinants of health (SDOH), or rather, factors that specifically contribute to health, has been less understood. Research has shown that the availability of affordable housing, increase of walkable streets, as well as, a reduction in crime are SDOH related to gentrification and, more specifically TIG[33, 35]. Although the availability of walkable streets during the construction period of TOD may be limited, the use of LRT after construction has been found to be associated with an increased likelihood of walking[62]. For example, cross-sectional analyses reported that both men and women who reported a positive neighborhood changes inconvenience were twice as likely to increase their walking afterwards[63]. In regard to rates of crime and gentrification, this relationship has yielded inconclusive findings over the past several decades. A time-series analysis of crime rates between 1970 and 1984 in 14 gentrified neighborhoods throughout Boston, MA; New York, NY; San Francisco, CA; Seattle, WA and Washington, D.C. indicated some eventual reduction in personal crime rates, but that there was no significant effect on property crime rates[64]. Despite the crime type, the direct

relationship between fear or perception of neighborhood crime and community composition change, have affirmed the characteristics of gentrification[65, 66]. Furthermore, areas that are gentrifying and changing economically typically draw in more police surveillance and "create conditions" for more "behavior misconduct" or behaviors that were previously considered normal, but that is now viewed as suspicious among the newcomers[67]. Although the relationship with TIG perception and SDOH may have varying directions of association, it is hypothesized that perceived TIG among current residents will be positively related to walkability changes and positively related to changes in crime within the neighborhoods.

Gauging Effects of Neighborhood Trends and Sickness

THE GENTS STUDY

While some health outcome changes and SDOH have been found to be associated with gentrification and specifically displacement, there is a paucity of data examining the health impacts related to TIG perception. Furthermore, prior research utilized existing data and examined health outcome relationships retrospectively. The GENTS Study (Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County) will address these limitations by using a longitudinal research framework at the neighborhood level in order to examine health impacts related to TIG perception. Leveraging an expansion of the Washington D.C. Metropolitan Area Transit Authority System as a natural experiment, the GENTS Study will add novel and unexplored evidence on the neighborhood, health and TIG effects of a TOD within Prince George's (PG) County, Maryland during the construction period and before operation of the Purple Line (PL) LRT. In Spring 2022, the PL, a 16.2-mile LRT line, will begin operation in PG County, a suburban area of Washington, D.C., comprised of over

80% African American and Hispanic residents[68]. The GENTS Study will take advantage of this natural experiment and evaluate PL LRT-related neighborhood changes and associated health impacts of perceived TIG among PG County adults in a prospective case-comparison design involving cases living close to the PL LRT vs. controls living father from the PL LRT, but who are similar demographically and in the initial built environment with two points of data collection (e.g., wave 1 and wave 2). Although "case-comparison" contrasts to the "case" and "control" definitions in traditional epidemiology, here case-comparison is defined as a study which compares a group receiving a built environment change or intervention (e.g., PL LRT) to a comparison group that is not directly receiving the built environment change because of proximity or distance[69]. Overall, the research question presented with this GENTS Study is whether or not neighborhood perceptions, in the form of perceived TIG, can have deleterious effects on anxiety and CVD risk despite the initial health status of the current residents.

Approximately 20 pre-post natural experiment studies of a built environment change exploring longitudinal impacts have been conducted in the United States [70-72]. Among these, only seven studies examined the impact of a new LRT, and the participant samples of all but one study consisted of over 70% White and non-Hispanic adults[62, 72-76]. The one study was composed of 45% African Americans, but there were over 90% non-Hispanic adults[77]. Since it has been established that impoverished neighborhoods and communities of color often bear the brunt of unintended TOD impacts, there is an urgent need to establish the effects of a built environment modification and specifically a major transportation infrastructure change on perceived TIG and associated health outcome and SDOH changes among this population.

GENTS Study Aim I: Compare Perceived TIG with Health Outcome Changes

For this first aim, the GENTS Study will assess the association of perceived TIG with measured health outcome changes ((Ia) anxiety; (Ib) CVD risk) among PG County adults while also comparing these associations between cases and controls. At two pre-PL LRT data collection points, perceived TIG, and both health outcomes measures will be examined. Perceived TIG, anxiety, and CVD risk will be assessed in order to examine changes in perceived TIG with changes in health outcomes. The objective of this aim is to determine whether the impact of perceived TIG (e.g., adverse or negative neighborhood changes) will have an adverse impact on health outcomes and if these impacts vary between case and control residents.

GENTS STUDY AIM II: COMPARE PERCEIVED TIG WITH SDOH CHANGES

The GENTS Study will assess the association of perceived TIG with SDOH changes, including measured ((IIa) walkability, (IIb) crime), and perceived ((IIc) walkability; (IId) crime), and compare these associations in cases and controls at two pre-PL LRT data collection points. This aim is not suggesting that perceived TIG will lead to changes in walkability or crime. However, if there are increases in measured or perceived walkability or crime, which are often byproducts of TIG, then it would be expected that increases in perceived TIG would be observed.

METHODS AND ANALYSIS

Purple Line Light Rail Line

Under the Maryland Transit Administration (MTA) leadership, the 16.2-mile PL LRT is anticipated to open for operation in late 2022[78]. However, it was announced late 2019, that the line would open in two phases. The first segment carrying passengers in PG County will open in late 2022 and the remainder of the line will open in 2023. The PL LRT, which began construction in 2016, will extend east from Bethesda (Montgomery County) to New Carrolton (PG County) and

connect to existing Red, Green, and Orange Metrorail lines of the Metro System (Figure 1)[79]. Within PG County, there will be a total of 11 stops/stations, including five stops that will be located directly on or adjacent to the University of Maryland (UMD) campus. PL LRT will operate mainly in dedicated lanes and will also connect to MARC, Amtrak, and local bus services. It will consist of quietly operated modern streetcars powered by overhead wires with neighborhood stations convenient for pedestrians[78]. The PG County portion of the PL LRT will be bookended by the Takoma Langley Transit Center and New Carrolton Metrorail stop. The entire PL LRT will connect PG County with Montgomery County, one of the most affluent areas in the United States, and an attraction for employment and entertainment. Areas around the new PL LRT stations/stops in PG County will experience infrastructure changes, new housing, retail development, and the construction of a bike path through the UMD Campus[78].

Study Design and Setting

As a supplement to the existing Purple Line Impacts on Neighborhood, Health and Transit (PLIGHT) Study, which is focusing on changes in physical activity, active transportation, obesity and obesity related-CVD, the GENTS Study will examine the perception of TIG and its relationship to health outcomes and SDOH changes in the pre-PL LRT period[80]. The GENTS Study will use a prospective case-comparison design to evaluate PL LRT related neighborhood changes and associated health impacts of perceived TIG among PG County adults. The intervention site will consist of case residents within a 1-mile buffer around the PL LRT stations/stops in PG County. The 1-mile buffer was chosen because it includes a comfortable walking distance and supports research indicating that individuals are willing to walk to reach transit beyond the frequently cited 0.25-to-0.50-mile demarcation[81-88]. Control residents will

consist of individuals living greater than 1-mile but less than 5-miles from the PL LTR stations/stops (Figure 2). Participant or the public wer not involved in the design, or conduct, or reporting, or dissemination plans of our research

Participant Recruitment and Study Population

A rolling recruitment and enrollment strategy will be used with three questionnaire deployment pathways over a 12-month wave (Wave 1 - July 2020 to June 2021) in order to achive a baseline sample. Once achieved, the second data collection point will occur during a second 12-month wave (Wave 2 – July 2021 to June 2022). Questionnaire deployment pathways [(A) Snowball Sampling; (B) On-Site Sampling; (C) Email Blast Sampling] will cast the initial recruitment net from the PL LRT catchment area. Eligible participants must be an adult (18 years and older) and a PG County resident. Individuals will not be eligible to participate if they (a) have a physical impairment, disability, or medical condition that prevents them from engaging in normal daily activities; or (b) are planning to relocate away from the study area and/or PG County within 36 months from the study baseline. Therefore, UMD students will be excluded. For each of the two waves of data collection, participants will be offered a $25 gift card.

To determine the required number of participants, four assumptions for the sample size calculation were used: (1) the attrition from wave 1 to wave 2 data collection is 9%; (2) equal sample sizes between case and control groups at baseline (wave 1); (3) power of 0.9; (4) correlation between multiple measurements within a participant is between 0.5 and 0.8; and (5) minimum detectable effect size of 0.3 standard deviation units of PL LRT use at the second data collection. Therefore, a total of 800 participants at baseline based on these assumptions is required. Each participant's home address will determine if s/he is a case or control participant. During

recruitment, the demographics of the participant sample will be continually evaluated to maintain its representation. If required, additional targeted recruitment will be initiated to ensure demographic consistency and adequate case and control representation. Also, as data are collected, researcher-to-participant contact will be maintained with birthday messages, reminders, study newsletters, and update emails of the GENTS Study.

GENTS Study Questionnaire

QUESTIONNAIRE DEPLOYMENT

Qualtrics.com will host the online GENTS Study questionnaire in English and Spanish (Figure 3). Forward and backward translation validation will occur for the Spanish language questionnaire. Three questionnaire deployment pathways will be used on a rolling basis. The first deployment pathway will occur through snowball sampling with community partnerships, referrals from one-on-one interview participants, and mining community email databases (e.g., PG County Department of Parks and Recreation). Community outreach efforts, such as distributing informational quarter cards to recreational community centers and publishing announcements in local circulars with the GENTS Study website and questionnaire link, will be employed to recruit a representative sample and target underrepresented populations. The second deployment pathway will occur through on-site sampling. GENTS Study researchers will attend community events (e.g., farmer's markets), equipped with iPads for participants to begin questionnaires in person, and show how individuals can complete the questionnaire on their smartphones since Qualtric.com provides a very user-friendly smartphone platform. According to Pew Research Center, nearly all Americans (96%) now own a cellphone[89]. For individuals who are unable to complete the questionnaire on-site, GENTS Study informational quarter cards will be distributed with the

website and questionnaire link. Finally, the third deployment pathway will occur through email blast sampling with the Alesco Data Group, a direct marketing services company that draws from a consumer database of over 149 million addresses in the United States[90]. This third pathway will begin with the purchase of 10,000 PG County household email addresses matched with resident name and postal address within the GENTS Study catchment area for the recruitment of case and control participants. Invitational questionnaire links will be emailed to all 10,000 addresses. While recruitment will occur through three questionnaire deployment pathways as previously described, for the third deployment pathway, we anticipate an 5% response rate, resulting in a sample of approximately 500 (250 cases; 250 controls), based on prior research within this regional population[91, 92]. Predictions about the sample size generated from the other pathways cannot be estimated at this time. Therefore, a conservative sample prediction of 500 will be used.

QUESTIONNAIRE MEASUREMENT

TIG is a phenomenon that may occur rapidly at times, and the GENTS Study will examine TIG perception during the pre-PL LRT period. It is essential to capture information on individual perceptions and examine how or why those perceptions may or may not change. Perceived TIG will be assessed through the questionnaire items. Findings from previous TIG research identifying gentrification indicators, as well as the qualitative data collected for the PLIGHT Study, will inform the development of these questionnaire items[80]. In addition, demographic information and other relevant information, such as housing tenure, homeownership, transit, and commuting patterns, and physical activity behaviors will also be collected as these data may influence TIG perception.

Sense of community, as well as anxiety, will be assessed using the Sense of Community Index Version Two (SCI-2) and Kessler Psychological Distress Scale (K10), respectively. SCI-2, an instrument bridging the public health, environmental psychology, engineering, and design fields, demonstrates high reliability with strong validity[93, 94]. Furthermore, K10 is a reliable and valid 10-item questionnaire providing a global measure of distress based on questions about anxiety and depressive symptoms experienced in the most recent month[95].

Although CVD generally includes heart conditions involving diseased vessels, structural problems, and blood clots, capturing each and every type of stage of CVD is not only impractical, but it also would not necessarily identify early disease stage individuals. Therefore, changes in hypertension, one of the strongest risk factors for almost all different types of CVD, will be used as the primary metric for CVD risk[44]. Questionnaire items assessing hypertension and CVD prevalence will be adopted from the National Health and Nutrition Examination Survey (NHANES). Additionally, questions from the Framingham Heart Study will be used to ask about key traditional CVD risk factors.

Changes in actual walkability during the pre-PL LRT period will be examined in two ways. First, components of walkability, including street connectivity, infrastructure for walking, neighborhood aesthetics, traffic, and crime safety, will be assessed with the Neighborhood Environment Walkability Survey – Abbreviated (NEWS-A)[96]. Second, WalkScore, a large-scale, publicly available index that assigns a numerical walkability score to any address in the United States, will also assess changes in walkability through PG County neighborhoods[97]. Perceived walkability will be assessed through items previously used in validated instruments[98].

Finally, changes in personal and property crime rates will be examined during the Pre-PL LRT period. Data on assaults, burglaries, homicides, robberies, sex offenses, stolen vehicles, thefts, and

vandalism will be obtained from the PG County Police Department data. These data will be geographically mapped so that spatial and temporal changes in crime can be assessed. Additionally, perceived crime will be assessed through questionnaire items previously used in validated instruments[98].

Data Management and Analyses

Throughout the course of the GENTS Study, data will be downloaded from Qualtrics.com and managed on a secure and password protected UMD sever. All non-electronic data will be stored in a locked file cabinet that is located in the swipe card and key accessed PHOEBE Lab of the PI (Roberts). Visualizations and descriptive statistics will examine data distributions, identify category thresholds, outliers, and missing values, and audit data for any problems with the planned statistical methods. Variables may be transformed or analogous non-parametric tests used if statistical assumptions are severely violated. The population representativeness of the sample and comparability between case and control groups will be evaluated. As missing data problems arise, sensitivity analyses will evaluate statistical tests for robustness.

Comparisons between groups (e.g., cases vs. control) will be performed to address sources of bias and strengthen the causal inferences from this natural experiment. Initially, t-tests among cases and controls and longitudinally will be conducted. Paired t-tests will be used to compare health outcome and SDOH changes within the two pre-PL LRT periods. Additionally, to assess health outcome and SDOH changes, latent growth curve (LGC) modeling will be used[99]. This technique can model linear and curvilinear relationships and incorporate other statistics to determine if the hypothesized models adequately fit the observed data[5, 99]. LGC can be structured as a piecewise model, such that discrete periods of time can have markedly different slopes[100].

LCG can accommodate latent or unobserved factors and can handle both time-variant (e.g., neighborhood perceptions) and invariant (e.g., race/ethnicity) variables[101]. There is no requirement that there be more than two measurements or that the measurement times be equally spaced[102]. Also, individual times of observation are allowed to vary.

For Aim I, LGC modeling will first construct unconditional LGC measurement models, in which perceived TIG and psychological stress are each modeled only as a function of time[99, 103, 104]. If a linear model is not satisfactory, alternative curvilinear models can be specified and tested. Since this aim seeks to determine Wave 1 vs. Wave 2 18- PR LRT effects, a piecewise growth model may also be specified[100]. This approach may be appropriate if a sharp initial increase in perceived TIG and anxiety in the months closer to the PL LRT opening are observed. Second, if substantial individual variance around the mean growth curve is observed in the unconditional model, the growth factors (the latent slope(s) and intercept) will be regressed on exogenous explanatory variables in a conditional LGC model[103, 104]. For Aim I, the primary explanatory variable is whether or not a participant resides in the PL LRT intervention (case vs. control area). This takes the general form of $\eta_i = \pi + \gamma X_i + \beta_i T_i + \varepsilon_i$, where $\underline{\eta_i}$ is a J x 1 vector of latent growth factors, $\underline{\pi}$ is a J x 1 vector of regression intercepts, X_i is a K x 1 vector of covariate variables, γ is a J x K matrix of regression coefficients, $\underline{T_i}$ is the intervention indicator variable, $\underline{\beta_i}$ is the coefficient for the treatment indicator variable, and $\underline{\varepsilon_i}$ is a J x 1 vector of residuals which has a multivariate normal distribution accounting for the within-subject correlation. If the change over time in perceived TIG and anxiety is different in the case participants exposed to the new PL LRT line compared to the control participants not exposed, and understanding of this phenomenon can be achieved by regressing the growth factors on the PL LRT case vs. control condition (located in the x vector). The x vector contains covariates, such as sex, race, age, and propensity scores. This

modeling application will be repeated to model CVD risk, specifically hypertension. Furthermore, this modeling approach will be repeated for Aim II in order to model the association of walkability and crime with perceived TIG while also comparing these associations between cases and controls.

DISCUSSION

This natural experiment is one of only a few to investigate the relationship between perceived TIG, health outcomes and SDOH in a predominant community of color. The diversity of the PG County Study population, comprised of over 80% African American and Hispanic residents, is a unique feature of this research especially considering the fact that the African American proportion of similar studies performed in Philadelphia and California was 22% and 5.6% respectively[105] [51, 106]. The inclusion of these underrepresented populations is crucial to the validity of the study results, but more importantly the adequate representation of the GENTS' Study is essential to address the research questions and policy issues that are specifically tailored to Prince George's County.

This research will add to the growing body of literature and urgency suggesting that plans to invest in transportation infrastructure can impact the health of the residents even before the infrastructure is in place. There has been very little research on whether different phases of the LRT construction, independent of public investments and regulations, have any effect on the gentrification process and/or the health of the residents. One approach to exam this issue is to observe and evaluate how residents and other community stakeholders respond to the announcement of TOD plans. For example, one of the main questions posed by Knaap, Ding, and Hopkins was "Do Plans Matter?". It was found that plans do indeed matter when the plans for LRT investments increased the land value in proposed station areas[107]. Most recently National

Public Radio published an article entitled "How To Limit Gentrification Along The Purple Line, According To Housing Advocates" where is was stated that "Apartment dwellers in Langley Park, Maryland, are at risk of rent hikes as the Purple Line spurs development in the area"[108]. A plan from the Purple Line Corridor Coalition, a group of nonprofit leaders, planners, developers and others convened by UMD's National Center for Smart Growth to advise local leaders and organizations, recommends actions to preserve affordable housing and reduce displacement along the path of the PL LRT, which is expected to transform economically distressed neighborhoods[108]. Since gentrification is a dynamic process, it is necessary to compare regional changes over time and space. The GENTS Study will identify changes over time in perceived TIG, health and SDOH among case and control residents before the completion and operation of the PL LRT, an under researched period of TOD. Furthermore, this research will be able to capture evidence as to the effectiveness of the Purple Line Corridor Coalition plan.

While strengths of this study lie in the diversity of the study population as well as the timing of the study, it is important to recognize possible challenges. It is expected that recruitment efforts may take a longer period of time considering that recruitment will occur within in a predominately African American and Hispanic population who may have a strong hesitancy and an overarching sense of distrust with research participation[109-111]. Maryland has a large immigrant population (15.2%) and over 27% are undocumented and are centered in PG County[112, 113]. As such, time is needed for community engagement in order to demonstrate trustworthiness and commitment. Additionally, retention efforts will need to be robust through consistent participant communication and community visibility of the GENTS Study. Despite these limitations, it is anticipated that the GENTS Study will contribute significantly to the research field and fill gaps in the literature on the health and well-being impacts of TIG. Moreover, findings from this research will be able to

address research questions and policy issues that are specifically tailored to PG County while also providing more effective policy solutions for other regions undergoing TOD.

ETHICS AND DISSEMINATION

Ethics Approval and Consent to Participate

The Institutional Review Board at The University of Maryland at College Park has approved this study protocol (Figure 4). Information about the GENTS Study will be provided at the beginning of the questionnaire. This information will be written at a reading level that is easily understood by all, indicating that participation is voluntary, that he/she is free to withdraw participation any time without penalty, a description of measures that will be taken to ensure privacy, and how the results will be used. Adult participants will be required to click a button to acknowledge that they have read the study information and then informed consent will be obtained upon questionnaire completion. The informed consent form will be returned electronically with the questionnaire. Participants will be instructed to print or email a copy for their records.

Competing Interest

The authors declare that they have no competing interests.

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Authors' Constributions

JDR conceived and designed the GENT Study. JDR wrote and drafted the manuscript with SOT. EAS and RI edited components of the manuscript. VNG provided methodology expertise for the study design. MLB provided GIS expertise and created the GENT Study map. All authors have read and approved the manuscript.

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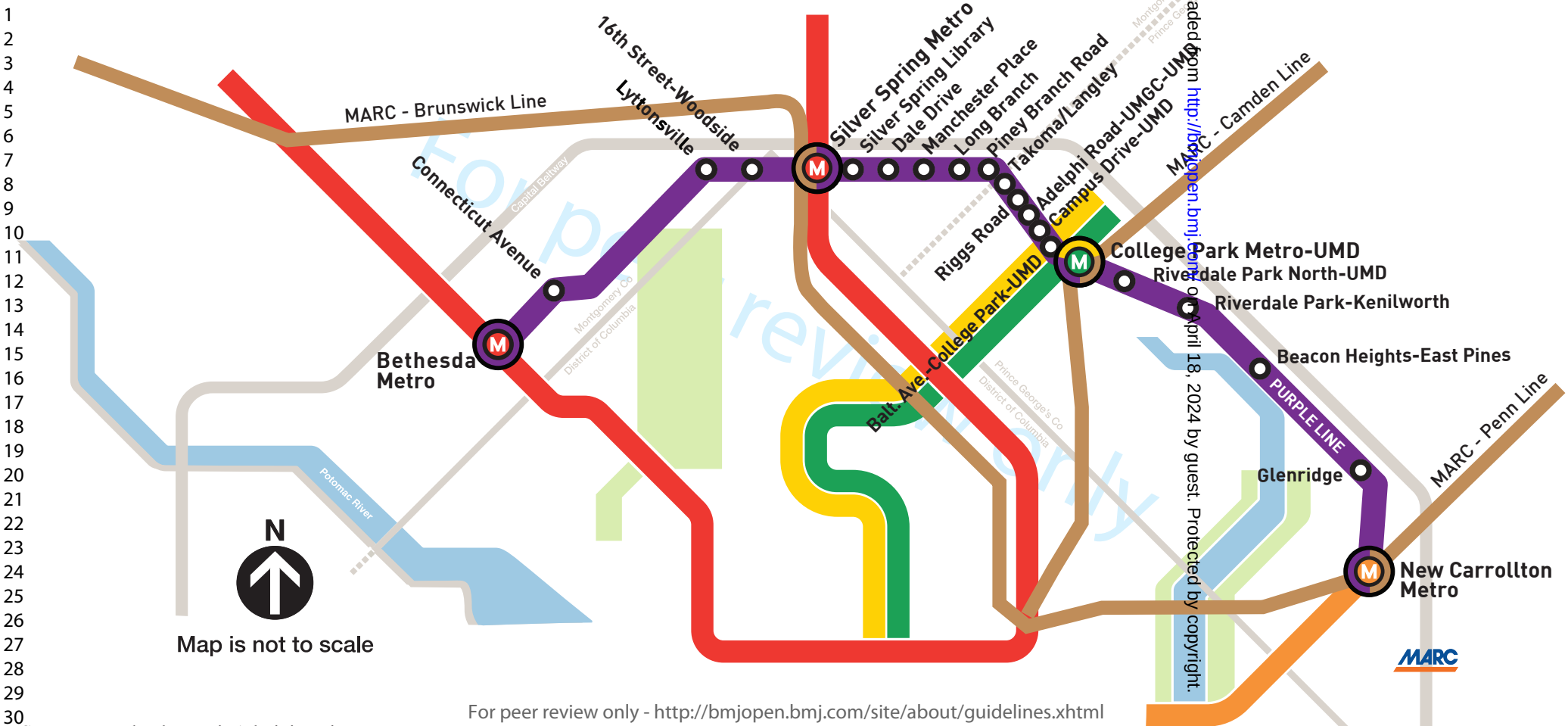
FIGURE LEGENDS

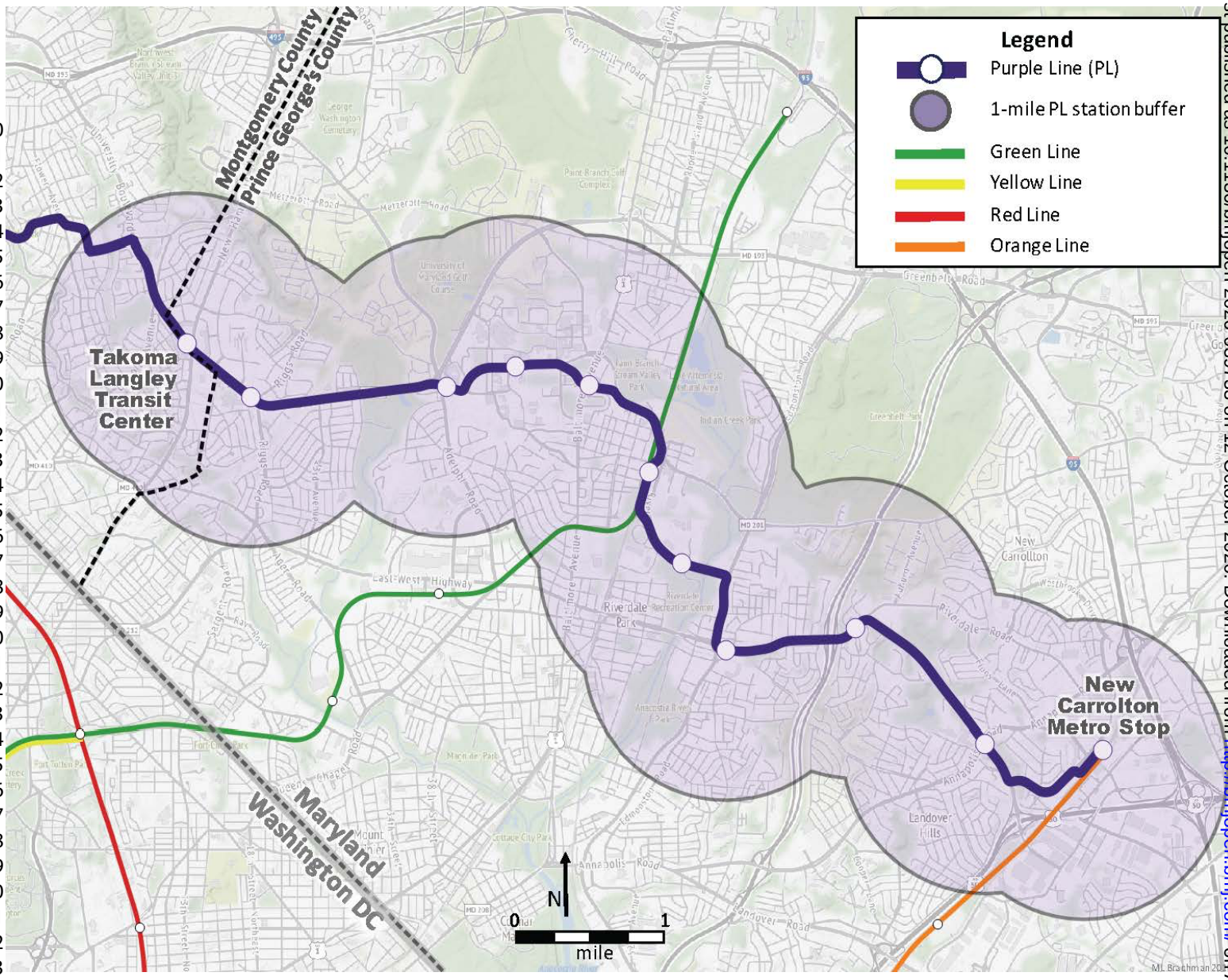
Figure 1 – MTA Purple Line Map
Figure 2 – GENTS Study Setting
Figure 3 – GENTS Study Questionnaire
Figure 2 – GENTS Study IRB Approval

Figure 1 - Maryland Transit Administration Purple Line Map



Source: Maryland Transit Administration

Figure 2 – GENTS Study Setting



Gauging the Effects of Neighborhood Trends on Sickness

QUESTIONNAIRE

GENTS

GAUGING THE EFFECTS OF NEIGHBORHOOD TRENDS ON SICKNESS:
EXAMINING PERCEPTIONS OF TRANSIT-INDUCED GENTRIFICATION IN PRINCE GEORGE'S COUNTY

STUDY

Thank you for participating in the GENTS Study.

Dr. Jennifer D. Roberts, along with her PHOEBE Laboratory research at the University of Maryland, is conducting the GENTS Study to examine gentrification and its impact on health and well-being among Prince George's County residents. We would greatly appreciate it if you could complete this questionnaire as soon as possible. It should take about 30 to 60 minutes to complete. Feel free to stop and take breaks as needed. Upon completion, you will receive your $25 gift card.

Here are a few things to keep in mind while working on the questionnaire:

- All your responses are completely confidential. They will not be seen by anyone except researchers at the University of Maryland. Responses to your questions will be grouped with the responses of others.
- Please answer each question as accurately and honestly as possible.
- Once you have finished, please double check to make sure you didn't miss any questions.
- Your participation in completing this questionnaire is voluntary and you can stop at any time.

Again, thank you for completing this questionnaire and participating in the GENTS Study. If you have any questions, please feel free to contact us by phone or email.

Principal Investigator: Dr. Jennifer D. Roberts
Phone: 301-405-7748
Email: gentsstudy@umd.edu

1. What is today's date? _____(Month) _____ (Day) _____(Year)

QUESTIONS ABOUT YOU AND YOUR BACKGROUND

2. What is your gender? □ Male □ Female

3. Which of the following describes you? *(check all that apply)*
   - □ Hispanic or Latino
   - □ Black or African American
   - □ White
   - □ American Indian or Alaskan Native
   - □ Asian or East Indian
   - □ Native Hawaiian or other Pacific Islander
   - □ Other *(specify)* _____

4. What is your birth date? _____ (Month) _____ (Day) _____ (Year)

5. What is your height? _____ (Feet) _____ (Inches)

6. What is your weight? _____ (Pounds)

7. Where you born in the United States? □ Yes □ No

8. What language do you speak most of the time at home?
   - □ English
   - □ Spanish
   - □ Other *(specify language)* _____
   - □ About the same in Spanish and English
   - □ About the same in another language and English *(specify Language)* _____

9. What is your current relationship status?
   - □ Married
   - □ Separated
   - □ Never married
   - □ Divorced
   - □ Widowed
   - □ Living with partner, not married

10. Including yourself, how many people live in your household? _____

11. Are you raising children? □ Yes □ No
    If YES: What is your relationship to these children?
    - □ My own
    - □ My grandchildren
    - □ Other's children

    How many children live with you that you are raising? _____

    What are the ages of the children who live with you? _____ _____ _____ _____ _____ _____

12. What is the highest grade of school or year of college you have completed?
    - □ Less than high school diploma / GED
    - □ High school diploma / GED
    - □ Some college, no degree
    - □ Associates or Technical degree
    - □ Bachelor's degree
    - □ Graduate or professional degree

13. What is the name of your neighborhood? _____

14. Are you planning to move in the next 12 months?
□ Yes, within the DMV area □ Yes, outside the DMV area □ No □ I don't know

15. What is your current home address?
Neighborhood: _____
Address: _____
City: _____ State _____ Zip _____

16. How long have you lived at your current home address? _____ Years _____ Months

17. Where did you live before you moved to your current home address? *(provide as much information as you can remember)*
Neighborhood: _____
Address: _____
City: _____ State _____ Zip _____
(If you don't know the exact address) Nearby cross streets: _____ & _____

18. Do you own or rent the place where you live? □ Own □ Rent

19. Do you live in a:
□ Manufactured / Mobile home □ Single Family home
□ Townhouse / Duplex /Attached in-law suite □ Apartment complex
□ Dorm room / fraternity / sorority house □ Other *(specify)* _____

20. What category best describes your average monthly mortgage or rent *(not including utilities)*?
□ $0 to $500 □ $501 to $1,000 □ $1,001 to $1,500 □ $1,501 to $2,000 □ $2,001 or more □ I don't know

21. Do other adults *(age 18 or over)* in the household work for pay? □ Yes □ No □ No other adults in the household

22. What category best describes your annual household income? *(pre-tax earnings from household members earned in the last 12 months)*
□ Under $20,000 □ $20,000 to $39,999 □ $40,000 to $59,999 □ $60,000 to $79,999
□ $80,000 to $99,999 □ $100,000 to 124,999 □ $125,000 to $149,999 □ Over $150,000
□ I don't know

QUESTIONS ABOUT YOUR NEIGHBORHOOD AND THE PURPLE LINE

As you may know, Maryland Transit Administration (MTA) is planning to open one new light rail train line (MTA Purple Line) within the DMV in 2022. This 16-mile light rail line will operate from Bethesda in Montgomery County to New Carrollton in Prince George's County. You were selected to participate in this study because you live in Prince George's County.

23. When the new MTA Purple Line opens, do you intend to use it? □ Yes □ No

24. Will you use this new MTA Purple Line for the following purposes?
Travel to work or school □ Yes □ No □ Not Sure

Daily or weekly shopping, such as grocery and/or pharmacy trips	□ Yes	□ No	□ Not Sure
Trips and errands, such as to the doctor or occasional shopping	□ Yes	□ No	□ Not Sure
To reach physical activities, such as a park or gym	□ Yes	□ No	□ Not Sure
To reach recreational activities, such as a movie theater or restaurant	□ Yes	□ No	□ Not Sure
To reach social activities, such as going to a friend's house	□ Yes	□ No	□ Not Sure

25. How much do you disagree or agree with the following statements? *(check one response for each statement)*

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know or Not Sure
I feel that I belong in my community or neighborhood	☐	☐	☐	☐	☐
I have a strong sense of purpose in my neighborhood	☐	☐	☐	☐	☐
I have a voice in my neighborhood	☐	☐	☐	☐	☐
I am trusted and trust my neighborhood	☐	☐	☐	☐	☐
I feel that I bring something of value to my neighborhood	☐	☐	☐	☐	☐
I feel emotionally connected to members in my neighborhood	☐	☐	☐	☐	☐
I participate in activities in my neighborhood	☐	☐	☐	☐	☐
I feel like I belong when I ride the DMV METRO bus or train	☐	☐	☐	☐	☐

26. The opening of a new MTA Purple Line may bring changes to your neighborhood. Please indicate whether the following items will decrease, stay the same, or increase **as a result of the MTA Purple Line opening.** *(check one response for each statement)*

	Definitely will DECREASE	Probably will DECREASE	Stay the Same	Probably will INCREASE	Definitely will INCREASE	Don't Know or Not Sure
The time it takes to get around DMV	☐	☐	☐	☐	☐	☐
The time it takes to get to my job or school	☐	☐	☐	☐	☐	☐
The time it takes to get to shops *(e.g., grocery store, bank, pharmacy, laundromat, etc.)*	☐	☐	☐	☐	☐	☐
Crime in my neighborhood	☐	☐	☐	☐	☐	☐
Noise in my neighborhood	☐	☐	☐	☐	☐	☐
Pollution in my neighborhood	☐	☐	☐	☐	☐	☐
Property values and taxes in my neighborhood	☐	☐	☐	☐	☐	☐
New people moving into my neighborhood	☐	☐	☐	☐	☐	☐
New homes, shops, and office buildings built in my neighborhood	☐	☐	☐	☐	☐	☐
Bus service in my neighborhood	☐	☐	☐	☐	☐	☐
Sense of community in my neighborhood	☐	☐	☐	☐	☐	☐

Pleasing appearance of my neighborhood	☐	☐	☐	☐	☐	☐
Crowdedness of street	☐	☐	☐	☐	☐	☐
Amount of litter in my neighborhood	☐	☐	☐	☐	☐	☐
Familiar local or family businesses	☐	☐	☐	☐	☐	☐

27. Please indicate how strongly you disagree or agree with the following statement.

"After the new MTA Purple Line opens, I intend to switch from traveling either by car or by bus to the MTA Purple Line light rail at least some of the time"

□ Strongly Disagree □ Disagree □ Agree □ Strongly Agree □ Don't Know or Not Sure

28. How much of a problem are the following in your neighborhood? *(check all that apply)*

	Not a Problem	**Somewhat of a Problem**	**Big Problem**
Litter/trash in the streets	O	O	O
Graffiti	O	O	O
Vacant housing	O	O	O
Poorly maintained property	O	O	O
Abandoned cars	O	O	O
Drinking in public	O	O	O
Selling or using drugs	O	O	O
Homeless people / street panhandlers	O	O	O
Groups of teenagers hanging out	O	O	O
People fighting / arguing	O	O	O
Exceeding speed limit	O	O	O
Excessive noise & Odors	O	O	O
Other: _____	O	O	O

29. Please indicate how frequently you have worried about becoming the victim of the following crimes in your neighborhood in the past month?

	EVERYDAY	**1-2 Times in Past WEEK**	**1-2 Times in Past MONTH**	**Not Once in Past MONTH**
Being physically attacked by a stranger in the street	O	O	O	O
Being robbed or mugged in the street	O	O	O	O
Being harassed, threatened, or verbally abused in the street	O	O	O	O
Having someone break into your home while you or your family **were there**	O	O	O	O
Having someone break into your home while you or your family **were NOT there**	O	O	O	O

30. This question refers to features of your *current* neighborhood and their importance in selecting a *new* neighborhood if you were to move. With "1" meaning "**Least"** *(Not True or Not Important)* and "4" meaning "**Most**" *(True or Important)*, please rate how well these features describe your *current* neighborhood and how important they are in selecting a *new* one if you were to move. *(circle one response per statement for Current Neighborhood and one per statement for New Neighborhood)*. **Please answer even if you do not plan to move to a new neighborhood in the future.**

	CURRENT NEIGHBORHOOD				NEW NEIGHBORHOOD			
Easy access to regional shopping mall	1	2	3	4	1	2	3	4
Easy access to downtown	1	2	3	4	1	2	3	4
Places such as a pool or a community center nearby	1	2	3	4	1	2	3	4
Shopping areas within walking distance	1	2	3	4	1	2	3	4
Easy access to the freeway	1	2	3	4	1	2	3	4
Connected bicycle routes beyond the neighborhood	1	2	3	4	1	2	3	4
Sidewalks throughout the neighborhood	1	2	3	4	1	2	3	4
Parks and open spaces nearby	1	2	3	4	1	2	3	4
Good public transit service	1	2	3	4	1	2	3	4
Quiet neighborhood	1	2	3	4	1	2	3	4
Low crime rate within neighborhood	1	2	3	4	1	2	3	4
Low level of car traffic on streets	1	2	3	4	1	2	3	4
Neighborhood is safe from traffic for walking	1	2	3	4	1	2	3	4
Neighborhood is safe from crime for walking	1	2	3	4	1	2	3	4
Neighborhood is safe from traffic for kids to play outside	1	2	3	4	1	2	3	4
Good street lighting	1	2	3	4	1	2	3	4
Diverse neighbors in terms of ethnicity, race and age	1	2	3	4	1	2	3	4
Lots of people out and about within the neighborhood	1	2	3	4	1	2	3	4
Lots of interaction among neighbors	1	2	3	4	1	2	3	4
Neighbors of similar economic level	1	2	3	4	1	2	3	4
Attractive appearance of neighborhood	1	2	3	4	1	2	3	4
High level of upkeep in neighborhood	1	2	3	4	1	2	3	4
Variety in housing design and styles	1	2	3	4	1	2	3	4
Big trees on the street	1	2	3	4	1	2	3	4
Large back yards	1	2	3	4	1	2	3	4
Large front yards	1	2	3	4	1	2	3	4
Lots of off-street parking with garages or driveways	1	2	3	4	1	2	3	4

31. How much do you disagree or agree with the following statements? *(check one response for each statement)*

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know or Not Sure
In my neighborhood, it is easy to buy fresh fruits and vegetables	☐	☐	☐	☐	☐
In my neighborhood, it is easy to buy tobacco products	☐	☐	☐	☐	☐
My neighborhood has the best food stores in town	☐	☐	☐	☐	☐
I prefer to shop for food at the local convenience store or corner store	☐	☐	☐	☐	☐
In my neighborhood, it is easy to buy alcohol	☐	☐	☐	☐	☐
The food stores in my neighborhood sell outdated or rotten products	☐	☐	☐	☐	☐
The local convenience store or corner store is expensive	☐	☐	☐	☐	☐
In my neighborhood, it is easy to buy healthy foods	☐	☐	☐	☐	☐

32. Please indicate how you feel to the following statements? *(check one response for each statement)*

	Not at All	Somewhat	Mostly	Completely
I get important needs of mine met because I am part of this community?	☐	☐	☐	☐
Community members and I value the same things	☐	☐	☐	☐
This community has been successful in getting the needs of its members met	☐	☐	☐	☐
Being a member of this community makes me feel good	☐	☐	☐	☐
When I have a problem, I can talk about it with members of this community	☐	☐	☐	☐
People in this community have similar needs, priorities, and goals	☐	☐	☐	☐
I can recognize most of the members of this community	☐	☐	☐	☐
Most community members know me	☐	☐	☐	☐
This community has symbols and expressions of membership such as clothes, signs, art, architecture, logos, landmarks, and flags that people can recognize	☐	☐	☐	☐
I put a lot of time and effort into being part of this community	☐	☐	☐	☐
Being a member of this community is a part of my identity	☐	☐	☐	☐

Fitting into this community is important to me	☐	☐	☐	☐	
This community can influence other communities	☐	☐	☐	☐	
I care about what other community members think of me	☐	☐	☐	☐	
I have influence over what this community is like	☐	☐	☐	☐	
If there is a problem in this community, members can get it solved	☐	☐	☐	☐	
This community has good leaders	☐	☐	☐	☐	
It is very important to me to be a part of this community	☐	☐	☐	☐	
I am with other community members a lot and enjoy being with them	☐	☐	☐	☐	
I expect to be a part of this community for a long time	☐	☐	☐	☐	
Members of this community have shared important events together, such as holidays, celebrations, or disasters	☐	☐	☐	☐	
I feel hopeful about the future of this community	☐	☐	☐	☐	
Members of this community care about each other	☐	☐	☐	☐	

33. How much do you disagree or agree with the following statements? *(check one response for each statement)*

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I have experienced improved access to neighborhood amenities and city services.	☐	☐	☐	☐	☐
I have seen an influx of affluent or non-minority residents moving into the neighborhood.	☐	☐	☐	☐	☐
I have feared being “pushed out” of my neighborhood.	☐	☐	☐	☐	☐
Crime has decreased in my neighborhood.	☐	☐	☐	☐	☐
I have seen a disruption of local community ties and social networks.	☐	☐	☐	☐	☐
I have experienced or heard of others being harassed by their landlords to vacate an apartment.	☐	☐	☐	☐	☐
I have felt increasingly “out of place” in my neighborhood.	☐	☐	☐	☐	☐

I worry about feeling "unwelcome" in my neighborhood.	☐	☐	☐	☐	☐
I have observed changes to the sense of "community" in the neighborhood.	☐	☐	☐	☐	☐
I have observed a lot of renovation activity in the neighborhood.	☐	☐	☐	☐	☐

QUESTIONS ABOUT YOUR STRESS AND ANXIETY

34. These questions concern how you have been feeling over the past 30 days. Tick a box below each question that best represents how you have been.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
During the last 30 days, about how often did you feel tired out for no good reason?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel nervous?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel so nervous that nothing could calm you down?	☐	☐	☐	☐	☐
During the last 30 days, about how often deed you feel hopeless?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel restless or fidgety?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel restless you not sit still?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel depressed?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel that everything was an effort?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel so sad that nothing could cheer you up?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel worthless?	☐	☐	☐	☐	☐

35. These questions in this scale ask you about your feelings and thoughts over the past 30 days. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
During the last 30 days, how often have you been upset because of something that happened unexpectedly?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt that you were unable to control the important things in your life?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt nervous and "stressed"?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt confident about your ability to handle your personal problems?	☐	☐	☐	☐	☐
During the last 30 days, about how often have you felt that things were going your way?	☐	☐	☐	☐	☐
During the last 30 days, how often have you found that you could not cope with all the things that you had to do?	☐	☐	☐	☐	☐
During the last 30 days, how often have you been able to control irritations in your life?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt that you were on top of things?	☐	☐	☐	☐	☐
During the last 30 days, how often have you been angered because of things that were outside of your control?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt difficulties were piling up so high that you could not overcome them?	☐	☐	☐	☐	☐

36. A number of statements which people have used to describe themselves are given below. Read each statement and then circle the number at the end of the statement that indicates how you feel **right now**, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe your present feelings best.

	Not at All	Somewhat	Moderately So	Very Much So
I feel calm	☐	☐	☐	☐
I feel secure	☐	☐	☐	☐
I am tense	☐	☐	☐	☐
I feel strained	☐	☐	☐	☐
I feel at ease	☐	☐	☐	☐
I feel upset	☐	☐	☐	☐

I am presently worrying over possible misfortunes	☐	☐	☐	☐
I feel satisfied	☐	☐	☐	☐
I feel frightened	☐	☐	☐	☐
I feel comfortable	☐	☐	☐	☐
I feel self-confident	☐	☐	☐	☐
I feel nervous	☐	☐	☐	☐
I am jittery	☐	☐	☐	☐
I feel indecisive	☐	☐	☐	☐
I am relaxed	☐	☐	☐	☐
I feel content	☐	☐	☐	☐
I am worried	☐	☐	☐	☐
I feel confused	☐	☐	☐	☐
I feel steady	☐	☐	☐	☐
I feel pleasant	☐	☐	☐	☐

37. A number of statements which people have used to describe themselves are given below. Read each statement and then circle the number at the end of the statement that indicates how you feel **generally**. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe how you generally feel.

	Not at All	Somewhat	Moderately So	Very Much So
I feel pleasant	☐	☐	☐	☐
I feel nervous and restless	☐	☐	☐	☐
I feel satisfied with myself	☐	☐	☐	☐
I wish I could be as happy as others seem to be	☐	☐	☐	☐
I feel like a failure	☐	☐	☐	☐
I feel rested	☐	☐	☐	☐
I am calm, cool and collected	☐	☐	☐	☐
I feel that difficulties are piling up so that I cannot overcome them	☐	☐	☐	☐
I worry too much over something that really doesn't matter	☐	☐	☐	☐
I am happy	☐	☐	☐	☐
I have disturbing thoughts	☐	☐	☐	☐
I lack self confidence	☐	☐	☐	☐
I feel secure	☐	☐	☐	☐
I make decisions easily	☐	☐	☐	☐
I feel inadequate	☐	☐	☐	☐
I am content	☐	☐	☐	☐
Some unimportant thoughts run through my mind and bothers me	☐	☐	☐	☐
I take disappointments so keenly that I can't put them out of my mind	☐	☐	☐	☐
I am a steady person	☐	☐	☐	☐
I get in a state of tension or turmoil as I think over my recent concerns and interests	☐	☐	☐	☐

QUESTIONS ABOUT YOUR HEART HEALTH

Hypertension (High Blood Pressure) is a repeatedly increased blood pressure with the first number 140 or higher and the second number 90 or higher.

38. Have you **ever** been told by a doctor or other health professional that you had hypertension, also called high blood pressure (Please do not include a time you were pregnant)?
□ Yes □ No □ Don't Know

39. Were you told on 2 or more **different** visits that you had hypertension?
□ Yes □ No □ Don't Know

40. How old were you when you were **first** told that you had hypertension or high blood pressure?

YES.....1
NO.....2 (BPQ.080)
REFUSED..... .....7 (BPQ.080)
DON'T KNOW.....9 (BPQ.080)

41. Because of your high blood pressure/hypertension, have you **ever** been told to take prescribed medicine?
□ Yes □ No □ Don't Know

Prescribed Medicine: Prescribed medicines are those ordered by a doctor or other health provider through a written or verbal prescription for a pharmacist to fill. Prescription medicines can also be given by a medical provider directly to a patient to take home, such as free samples.

42. Are you **now** taking a prescribed medicine to lower your high blood pressure?
□ Yes □ No □ Don't Know

43. Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
□ Yes □ No □ Don't Know

Cholesterol is a type of fat in the bloodstream and is measured with a blood test, usually done in the morning before you've eaten. High levels of cholesterol are a major risk factor for heart disease, which leads to heart attack.

44. Have you **ever** had your blood cholesterol checked?
□ Yes □ No □ Don't Know

45. About how long has it been since you **last** had your blood cholesterol checked? Has it been…
□ Less than 1 year ago
□ 1 year but less than 2 years ago
□ 2 years but less than 5 years ago, or
□ 5 years or more
□ Don't know

46. To lower your blood cholesterol, have you **ever** been told by a doctor or other health professional **to take prescribed medicine**?
□ Yes □ No □ Don't Know

47. Are you **now** taking a prescribed medicine to lower your blood cholesterol?

□ Yes □ No □ Don't Know

48. Have you smoked cigarettes regularly since your last physical exam?

□ Yes □ No □ Don't Know

49. If yes to question #46, how many cigarettes do/did you smoke **a day**?

□ 10 cigarettes or less □ 21-30 cigarettes

□ 11 -20 cigarettes □ 31 or more cigarettes

50. Do you drink any of the follow beverages at least once a month?

□ Beer □ Wine □ Liquor/spirits □ Don't consume alcohol

51. What is your average number of alcohol servings in a typical week or month since your last physical exam? Please answer your alcohol intake either weekly or monthly.

Beverage	**Per Week**	**Per Month**
Beer (12oz bottle, glass, can)	_____	_____
Wine (red or white, 40z glass)	_____	_____
Liquor/spirits (1oz cocktail/highball)	_____	_____
□ Check here if you do not consume alcohol		

52. Do you usually have a cough? (Exclude clearing of the throat)

□ Yes □ No □ Don't Know

53. Do you usually have a cough at all on getting u or first thing in the morning?

□ Yes □ No □ Don't Know

If **YES** to either question #50 or 51 above, please answer the following:

54. Do you cough like this on most days for three consecutive months or more during the past year?

□ Yes □ No □ Don't Know

55. How many years have you had this cough? _____ number of years

56. Are you troubled by shortness of breath when hurrying on level ground or walking up a slight hill?

□ Yes □ No □ Don't Know

57. Do you have to walk slower than people of your age on level ground because of shortness of breath?

□ Yes □ No □ Don't Know

58. Do you have to stop for breath when walking at your own pace on level ground?

□ Yes □ No □ Don't Know

59. Do you have to stop for breath after walking 100 yards (or after a few minutes) on level ground?

□ Yes □ No □ Don't Know

60. Have you been told by your doctor you had heart failure or congestive heart failure?
□ Yes □ No □ Don't Know

QUESTIONS ABOUT YOUR NEIGHBORHOOD WALKABILITY

We would like to find out more information about the way that you perceive or think about your neighborhood. Please answer the following questions about your neighborhood and yourself. Please answer as honestly and completely as possible and provide only one answer for each item. There are no right or wrong answers and your information is kept confidential.

61. Types of residences in your neighborhood: Among the residences in your neighborhood…

	None	A Few	Some	Most	All
How common are detached single-family residences in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are townhouses or row houses of 1-3 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos 1-3 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos 4-6 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos 7-17 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos more than 13 stories in your immediate neighborhood?	☐	☐	☐	☐	☐

62. Stores, Facilities, and other things in your neighborhood: About how long would it take to get from your home to the nearest businesses or facilities listed below if you walked to them? *Please put only one check mark for each business of facility.*

	1-5 min	6-10 min	11-20 min	21-30 min	31+ min	Don't know
Example: gas station	☐	☐	✓	☐	☐	☐
Convenience/small grocery store	☐	☐	☐	☐	☐	☐
Supermarket	☐	☐	☐	☐	☐	☐
Hardware store	☐	☐	☐	☐	☐	☐
Fruit/vegetable market	☐	☐	☐	☐	☐	☐
Laundry/ dry cleaners	☐	☐	☐	☐	☐	☐
Clothing store	☐	☐	☐	☐	☐	☐
Post office	☐	☐	☐	☐	☐	☐
Library	☐	☐	☐	☐	☐	☐
Elementary school	☐	☐	☐	☐	☐	☐
Other schools	☐	☐	☐	☐	☐	☐
Book store	☐	☐	☐	☐	☐	☐

Fast food restaurant	☐	☐	☐	☐	☐	☐
Coffee place	☐	☐	☐	☐	☐	☐
Bank/credit union	☐	☐	☐	☐	☐	☐
Non-fast food restaurant	☐	☐	☐	☐	☐	☐
Video store	☐	☐	☐	☐	☐	☐
Pharmacy/drug store	☐	☐	☐	☐	☐	☐
Salon/barber shop	☐	☐	☐	☐	☐	☐
Your job or school	☐	☐	☐	☐	☐	☐
[check here _____ if do not have work away from home or do not attend school						
Bus or trolley stop	☐	☐	☐	☐	☐	☐
Park	☐	☐	☐	☐	☐	☐
Recreation center	☐	☐	☐	☐	☐	☐
Gym or fitness facility	☐	☐	☐	☐	☐	☐

63. Access to Services: Places for walking and cycling: Please check the box that best applies to you and your neighborhood. Both local and within walking distance mean within a 10-15 minute walk from your home.

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**
I can do most of my shopping at local stores	☐	☐	☐	☐
Stores are within easy walking distance of my home	☐	☐	☐	☐
Parking is difficult in local shopping areas	☐	☐	☐	☐
There are many places to go within easy walking distance of my home	☐	☐	☐	☐
It is easy to walk to a transit stop (bus, train) from my home	☐	☐	☐	☐
The streets in my neighborhood are hilly, making my neighborhood difficult to walk in	☐	☐	☐	☐
There are many canyons/hillsides in my neighborhood that limit the number of route for getting from place to place	☐	☐	☐	☐
	☐	☐	☐	☐

64. Streets in my neighborhood. Please check the answer that best applies to you and your neighborhood on neighborhood surroundings.

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**
The streets in my neighborhood do not have, or any, cul-de-sacs (dead-end streets)	☐	☐	☐	☐
There are walkways in my neighborhood that connect cul-de-sacs to streets, trails, or other cul-de-sacs	☐	☐	☐	☐
The distance between intersections in my neighborhood is usually short (100 yards or less; the length of a football field or less)	☐	☐	☐	☐
There are four-way intersections in my neighborhood	☐	☐	☐	☐

There are many alternative routes for getting from place to place in my neighborhood. (I don't have to go the same way every time).	☐	☐	☐	☐
The streets in my neighborhood are hilly, making my neighborhood difficult to walk in	☐	☐	☐	☐
There are many canyons/hillsides in my neighborhood that limit the number of route for getting from place to place	☐	☐	☐	☐
	☐	☐	☐	☐

65. Places for walking and cycling: please check the box that best applies to you and your neighborhood.

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
There are sidewalks on most of the streets in my neighborhood	☐	☐	☐	☐
The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks)	☐	☐	☐	☐
There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to	☐	☐	☐	☐
Sidewalks are separated from the road traffic in my neighborhood by parked cars	☐	☐	☐	☐
There is a grass/dirt strip that separates the streets from the sidewalks in my neighborhood	☐	☐	☐	☐

66. Neighborhood surroundings: Please check the box that best applies to you and your neighborhood

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
There are trees along the streets in my neighborhood	☐	☐	☐	☐
Trees gives shade for the sidewalks in my neighborhood	☐	☐	☐	☐
There are many interesting things to look at while walking in my neighborhood	☐	☐	☐	☐
My neighborhood is generally free from litter	☐	☐	☐	☐
There are many attractive natural sights in my neighborhood (such as landscaping, views)	☐	☐	☐	☐
There are attractive buildings/homes in my neighborhood	☐	☐	☐	☐

67. Safety from traffic: Please check the box that best applies to you and our neighborhood

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood	☐	☐	☐	☐	
There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.	☐	☐	☐	☐	
The speed of traffic on the street I live on is usually slow (30 mph or less)	☐	☐	☐	☐	
The speed of traffic on most nearby streets is usually slow (30 mph or less)	☐	☐	☐	☐	
Most drivers exceed the posted speed limits while driving in my neighborhood	☐	☐	☐	☐	
There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood	☐	☐	☐	☐	
The crosswalks in my neighborhood help walkers feel sage crossing busy streets	☐	☐	☐	☐	
When walking in my neighborhood, there are a lot of exhaust fumes (such as from cars, buses).	☐	☐	☐	☐	

68. Neighborhood satisfaction Below are things about your neighborhood with which you may or may not be satisfied. Using the scale below, indicate your satisfaction with each item by placing the appropriate check in the box. Please be open and honest in your responding.

	Strongly Dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Strongly Satisfied**
The highway access from your home?	☐	☐	☐	☐	☐
The access to public transportation in your neighborhood?	☐	☐	☐	☐	☐
Your commuting time to work/school?	☐	☐	☐	☐	☐
The access to shopping in your neighborhood?	☐	☐	☐	☐	☐
How many friends you have in your neighborhood?	☐	☐	☐	☐	☐
The number of people you know in your neighborhood?	☐	☐	☐	☐	☐
How easy and pleasant it is to walk in your neighborhood?	☐	☐	☐	☐	☐
How easy and pleasant it is to bicycle in your neighborhood?	☐	☐	☐	☐	☐
The quality of schools in your neighborhood?	☐	☐	☐	☐	☐
Your access to entertainment in your neighborhood (restaurants, movies, clubs, etc.)?	☐	☐	☐	☐	☐
The safety from threat of crime in your neighborhood?	☐	☐	☐	☐	☐
The amount and speed of traffic in your neighborhood	☐	☐	☐	☐	☐
The noise from traffic in your neighborhood?	☐	☐	☐	☐	☐

The number and quality of food stores in your neighborhood?	☐	☐	☐	☐	☐
The number and quality of restaurants in your neighborhood?	☐	☐	☐	☐	☐
Your neighborhood as a good place to raise children?	☐	☐	☐	☐	☐
Your neighborhood as a good place to live?	☐	☐	☐	☐	☐

QUESTIONS ABOUT YOUR NEIGHBORHOOD CRIME

We'd like to as you some questions about your local neighborhood. (Your 'local neighborhood' is the area within 15 minutes walk of your home).

69. Safety from Crime: Please check the box that best applies to you and your neighborhood on safety from crime.

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
My neighborhood streets are well lit at night	☐	☐	☐	☐
Walkers and bikers on the streets in my neighborhood can be easily seen by people in their homes	☐	☐	☐	☐
I see and speak to other people when I am walking in my neighborhood	☐	☐	☐	☐
There is a high crime rate in my neighborhood	☐	☐	☐	☐
The crime rate in my neighborhood makes it unsafe to go on walks during the day	☐	☐	☐	☐
The crime rate in my neighborhood makes it unsafe to go on walks at night.	☐	☐	☐	☐

70. Do you think there is a crime problem in your local neighborhood?
□ Yes □ No □ Don't Know

71. Please think about the amount of crime in your local neighborhood and whether or not this has changed over the past 12 months. Please select one only for each statement.

	Increased a lot	Increased a little	Stayed about the same	Reduced a little	Reduced a lot	Don't know	Haven't lived here for last 12 months
The amount of burglary in your local neighborhood has…	☐	☐	☐	☐	☐	☐	☐
The amount of violent crime (e.g. physical assaults) in your local neighborhoods has…	☐	☐	☐	☐	☐	☐	☐
The amount of crime committed by young people (e.g. aged under 17) in your local neighborhood has…	☐	☐	☐	☐	☐	☐	☐
The total amount of crime in your local neighborhood has…	☐	☐	☐	☐	☐	☐	☐

How many friends you have in your neighborhood?	☐	☐	☐	☐	☐	☐	☐
Would you say the level of police protection in your community has …	☐	☐	☐	☐	☐	☐	☐

72. In your view, what are the major causes of crime in your neighborhood today? Please select all that apply.

	EVERYDAY
Poverty	O
Poor education/poor schooling	O
Poor parentings	O
Drugs	O
Alcohol	O
Unemployment	O
Breakdown of family	O

73. Thinking about people currently serving prison sentences in your neighborhood…do you think that **most prisoners** are there for… (please select only one)
□ Violent and sex crimes (e.g. physical assaults, rapes) □ Property crimes (e.g. burglary, theft)
□ Drug-related crimes □ Don't Know

74. Do you feel there need to be more police patrols, about the same number of police patrols, or less patrols in your community?
□ More police patrols □ About the same number of police patrols □ less police patrols

75. Does your community have a neighborhood crime watch program?
□ Yes □ No □ Don't Know

76. Do you belong to a neighborhood crime watch?
□ Yes □ No □ We do not have a neighborhood crime watch

77. In the past three years, have you been a victim of crime in **your** neighborhood?
□ Yes □ No

78. Have you purchased a gun for protection from crime in your neighborhood?
□ Yes □ No

79. Do you own a dog from protection from crime in your neighborhood?
□ Yes □ No

80. How safe do you feel going out at night in your neighborhood?
□ Very Unsafe
□ Unsafe
□ Safe
□ Very Safe

81. Do you feel more crimes in your community are committed by juveniles, adults, or are they about the same?
□ Juveniles
□ Adults

□ About the same

82. What type of crime do you feel is more of a problem in your community: property crimes such as vandalism and theft, violent crimes such as assault and armed robbery, or are they about the same?
□ Property Crimes
□ Violent Crimes
□ About the same

83. Please rank the following crime-reducing measures based on how effective you feel each would be for your neighborhood with 1 being least effective and 5 being most effective at reducing crime.

	1	2	3	4	5
Increasing police patrols	☐	☐	☐	☐	☐
Legalizing drugs	☐	☐	☐	☐	☐
Stronger prosecution and sentencing	☐	☐	☐	☐	☐
Supervised activities for juveniles	☐	☐	☐	☐	☐
Enforced curfew for juveniles	☐	☐	☐	☐	☐

YOUR THOUGHTS ABOUT THE QUESTIONNAIRE

About how long did it take you to complete this questionnaire? _____ *minutes*

As you know, we will be contacting you next year to conduct a follow up questionnaire. If the questionnaire is about the same length as it is now, would you still be willing to complete it? □ Yes □ No

In case we are unable to reach you by phone, email or mail next year (for example, if you move from your current home), please provide the contact information for a close friend or relative who will know how to help us get in touch with you.

Name: _____

Street Address: _____

City, State and Zip code: _____

Phone: _____

Email Address: _____

Also, please provide any suggested names and email of individuals that you think may be interested in participating in the GENTS Study.

Name:	Email:
1.	
2.	
3.	

Now that you have completed this questionnaire, you will receive your $25 gift card.

Thank you! You are now done with the GENTS Study questionnaire!

UNIVERSITY OF MARYLAND
INSTITUTIONAL REVIEW BOARD

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DATE: April 22, 2020

TO: Jennifer Roberts
FROM: University of Maryland College Park (UMCP) IRB

PROJECT TITLE: [1573165-1] Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County Study
REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: April 22, 2020
EXPIRATION DATE: April 21, 2021
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7; Consent Waiver: 45CFR46.116(f)(2).

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Prior to submission to the IRB Office, this project received scientific review from the departmental IRB Liaison.

This submission has received Expedited Review based on the applicable federal regulations.

This project has been determined to be a MINIMAL RISK project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of April 21, 2021.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Unless a consent waiver or alteration has been approved, Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Please note that all research records must be retained for a minimum of seven years after the completion of the project.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

STROBE Statement Checklist

A Case-Comparison Study Protocol for Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1-2	
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2	
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-12	
Objectives	3	State specific objectives, including any prespecified hypotheses	4-12	
Methods				
Study design	4	Present key elements of study design early in the paper	12-18	
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	12-18	
Participants	6	(*a*) *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	12-18	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	12-18	
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	12-18	
Bias	9	Describe any efforts to address potential sources of bias	12-18	
Study size	10	Explain how the study size was arrived at	12-18	

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	12-18
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	12-18
		(*b*) Describe any methods used to examine subgroups and interactions	12-18
		(*c*) Explain how missing data were addressed	12-18
		(*d*) *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	n/a
		(*e*) Describe any sensitivity analyses	n/a
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	n/a
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	n/a
		(b) Indicate number of participants with missing data for each variable of interest	n/a
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	n/a
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	n/a
		Cross-sectional study—Report numbers of outcome events or summary measures	n/a
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a

Continued on next page

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n/a
Discussion			
Key results	18	Summarise key results with reference to study objectives	20-21
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	3
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	20-21
Generalisability	21	Discuss the generalisability (external validity) of the study results	20-21
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	22

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

A Case-Comparison Study Protocol for Gauging Effects of Neighborhood Trends and Sickness: Examining the Perceptions of Transit-Induced Gentrification in Prince George's County

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TITLE

A Case-Comparison Study Protocol for Gauging Effects of Neighborhood Trends and Sickness: Examining the Perceptions of Transit-Induced Gentrification in Prince George's County

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KEYWORDS

light rail transit; transit-induced gentrification; natural experiment; anxiety; cardiovascular disease, walkability, crime

ABSTRACT

Introduction: Impoverished neighborhoods and communities of color often bear the brunt of unintended transit-oriented development (TOD) impacts. These impacts have been known to come in the form of transit-induced gentrification (TIG), a socioeconomic by-product of TOD defined as a phenomenon that occurs when the provision of transit service, particularly light rail transit (LRT), "up-scales" nearby neighborhood(s) and displaces existing residents. Consequently, TIG or even the perception of TIG can impact health outcomes (e.g., anxiety) and social determinants of health (SDOH) (e.g., crime).

Methods/Analysis: In 2022, the Purple Line (PL), a 16.2-mile LRT line, is opening in Prince George's County, Maryland, a suburb of Washington, D.C., comprised of over 80% African American and Hispanic residents. By taking advantage of this natural experiment, we are proposing the GENTS (Gauging Effects of Neighborhood Trends and Sickness: Examining the Perceptions of Transit-Induced Gentrification in Prince George's County) Study in order to evaluate perceived TIG and associated health outcome and SDOH changes, at two points in time, among Prince George's County adults in a prospective case-comparison design during the pre-PL LRT period. Descriptive analysis and latent growth curve modeling will be used to examine these changes over time.

Ethics/Dissemination: Ethics approval has been granted by the University of Maryland Institutional Review Board. The GENTS Study will identify temporal changes in perceived TIG, health outcomes and SDOH among case and comparison residents before the completion and operation of the PL LRT, an under researched period of TOD. The dissemination of GENTS Study findings will be able to address research questions and policy issues that are specifically tailored

to PG County while also providing more effective procedural solutions for other regions undergoing TOD and TIG risk.

STRENGTHS AND LIMITATIONS

- This study is the first to prospectively investigate the relationship between gentrification perception and health using a longitudinal research framework at the neighborhood level.
- This natural experiment is one of only a few to investigate the relationship between perceived gentrification, health outcomes and social determinants of health in a community of color
- This study does not have a follow-up period. We intend to perform this examination in the coming years.
- In light of the COVID-19 pandemic, this study will primarily rely on the online environment for the recruitment of participants.

INTRODUCTION

Transit-Oriented Development in the United States

Although environmental justice is a movement addressing economic and health impacts of environmental inequality and racism, it also serves as a foundation for understanding why poor neighborhoods and communities of color often encounter transit inequities and bear the brunt of unintended transit-oriented development (TOD) impacts[1]. TOD was introduced by city planners and designers as a solution to a variety of urban problems, such as energy dependence, urban poverty, land consumption, traffic congestion, and public health challenges. TOD initiatives serve as powerful tools for improving the quality of life by reducing automobile dependence and increasing accessibility to employment and other transit destinations. Emerging as a popular and influential planning concept, TOD includes a mix of commercial, residential, and entertainment properties centered around or located near a transit station[2]. In an effort to create walkable, dense, mixed-use, and connected communities, TOD is an integration strategy for public transportation investments and land-use practices[3]. Therefore, TOD projects have increased in number over the past few decades with the rapid expansion of rail transit, particularly light rail transit (LRT) systems, in cities throughout the United States, such as Atlanta, GA; Detroit, MI; Milwaukee, WI; Charlotte, NC and Salk Lake City, UT [3, 4].

As a function of TOD growth, LRT use increased in passenger miles by 280% from 1990 to 2010 in the United States[5, 6]. LRT is characterized by electric trains running along fixed routes with dedicated track corridors and passenger boarding stations[7]. With smaller cars than commuter trains and traffic signal priority to ease efficiency, LRT has greater utility for implementation in densely populated metropolitan areas[8, 9]. For many reasons (e.g., mass transit expansion, urbanization), LRT and overall public transit use increased among Americans and tends

to be higher among African Americans, Hispanics or immigrants[10, 11]. For example, 34% of African American and 27% of Hispanic urban residents reported a daily or weekly use of public transit compared to only 14% of White residents[12]. Also, foreign-born vs. American-born (38% vs. 18%) urban residents have been found to use public transportation at a higher rate[12]. Possible reasons for higher transit use among these populations have included (1) a higher likelihood of living in large metropolitan areas where there tends to be more public transit options; (2) a higher likelihood of commuting to work; (3) a higher likelihood of living further away from jobs; and (3) a lower likelihood to automobile access[12].

Economic and Social Impacts of Transit-Oriented Development

TOD creates conditions for private investments, newly-built developments, and higher accessibility. Several studies characterized TOD outcomes as promoting economic development, elevating property values, and enhancing livable environments[13-17]. For example, research examining the housing premium associated with TOD in San Diego, CA found that a condo in a pedestrian-oriented environment and near a TOD, specifically a LRT station, had a significantly higher value than a condo in a similar neighborhood and not near a LRT station[15]. In an effort to rationalize wide-ranging results of empirical estimates, a meta-analysis using data drawn from twenty-three studies found that the price of properties near LRT increased by 8% and reached an upper limit range of 40%[18]. Another study also found that proximity to Phoenix, AZ LRT stations had a significant impact on housing values even before the actual LRT operations[19]. Furthermore, some health and well-being benefits are positively associated with TOD and namely LRT use. This has included reduced traffic crashes and air pollution emissions, increased physical activity

through active transportation, and improved access to medical care and healthy food options[17, 20, 21]. Along with these positive benefits, the negative impacts of TODs are also recognized.

TODs can ignite a "back-to-the-city" influx of high-income households due to the mixed land-use, walkability, and increased transit accessibility that results from these developments[13, 22]. In the United States, particularly since the surge of suburbanization in the 1950s, the ideologies, practices and policies of racially and economically based residential segregation have catalyzed a cyclical oscillation of "White Flight" from urban to suburban or suburban to urban areas. Although the social trend of "White Flight" may not be as prominent today as it was in the 1950s, there still has been an avoidance of racially or ethnically diverse neighborhoods among many White Americans in their residential relocation decisions[23]. Research demonstrates that these migration decisions are based on the "race-based neighborhood stereotyping hypothesis", which asserts that the avoidance of neighborhoods with communities of color are due to perceptions of poverty, crime, disorder, and ineffective schools[23, 24]. While these assertions are often cloaked in prejudicial inaccuracies, historically, people of color have lived in economically disinvested, disadvantaged, and impoverished areas. Unlike previous generations, however, the migration behaviors for generation Y or millennials may now be steeped in both a neighborhood ethno-racial composition preference as well as an inclination to live in urban centers. A recent study found that this generation has been the driving force of urban resurgence within the past two decades due to their desire to live in central urban neighborhoods[25]. Just as "urban renewal" resulted in the gentrification of older metropolitan neighborhoods and displacement of residents, "urban resurgence" has operated in the same manner[26]. The places designated for urban renewal or urban resurgence, which are most often neighborhoods with large communities of color consisting of low- or middle-income residents, have been shown to experience a disproportionate increase in

the number of White, young, well-educated, and middle- or high-income professionals[27-29]. Likewise, neighborhood and equity advocates have expressed concern that new TOD projects will lure wealthier and less diverse residents, which will lead to the displacement of existing populations, a phenomenon known as transit-induced gentrification (TIG)[30]. TIG, a TOD socioeconomic by-product, is defined as a phenomenon whereby the provision of transit service, particularly LRT, and associated area of development, change in the direction of neighborhood "upscaling"[31].

The role of LRT investments in triggering gentrification and displacement of low-income households has been examined in several cities throughout the United States, such as Portland, OR and Denver, CO[32, 33]. For instance, the median household income increased by 10% in Denver, CO neighborhoods near LRT stations and from 1990 to 2000 the housing values increased approximately 25% for those located within a mile from a LRT station [32]. During this same time period of 1990 to 2000, the negative impacts of TOD, primarily with the introduction of LRT stations, in 42 neighborhoods within 12 metropolitan areas that were first served by rail were observed through analysis[34]. While there was no fundamental change in neighborhood racial composition, rapid rises in rent and owner-occupied units were found, which resulted in more expensive housing stock, wealthier residents and increased vehicular ownership[34]. With rising property values and loss of affordable housing, displacement, social loss (e.g., disruption of neighborhood social networks) and segregation have been documented as unfavorable TIG externalities, particularly in transit station neighborhoods, which can impact current residents of the TOD[13, 31, 32, 35-41]. Even when positive neighborhood features, namely increased transit accessibility, are considered, many White Americans still prefer living among fewer persons of color and when they do relocate to these neighborhoods subtle mechanisms (e.g., park renaming;

cultural displacement) that encourage preexisting residents of color to move may ensue[42].[23, 43]. As such, social polarization, or rather the splintering of a group into distinct sub-groups that are positioned on different ends of a spectrum (e.g., rich vs. poor), can emerge as a byproduct of real-estate fluctuations and displacement[35].

Consequences of Perceived Transit-Induced Gentrification

PHYSICAL HEALTH CONSEQUENCES

In many low-income areas and communities of color, new transit investments are met with mixed reactions among current vs. new residents or among residents who stay vs. those who leave. In addition to the aforementioned negative impacts, TIG can engender health consequences when built, and social environments are rapidly transformed (Figure 1)[30]. Studies have found that populations displaced by gentrification, as compared to those who remained, typically have a shorter life expectancy, higher cancer rates, more birth defects, greater infant mortality, and higher incidence of asthma, diabetes, and cardiovascular disease (CVD)[36, 44-54]. In one study, hypertension, one of the strongest risk factors for CVD, was inversely associated with neighborhood affluence/gentrification (OR=0.7; 95%CI: 0.6, 0.9)[53, 55]. However, in another study, the risk of displacement was positively associated with hypertension (PR=1.25; 95%CI: 1.08, 1.46) and hypercholesterolemia, another risk factor for CVD, (PR=1.12; 95%CI: 1.01, 1.24) among a population of Hispanic renters in Chicago, IL; Miami, FL; New York City, NY and San Diego, CA[56]. It was also found that the perception of neighborhood problems and changes were strongly associated with adverse health behaviors, such as increased smoking, as well as hypertension in another cross-sectional study[57]. These findings on displacement risk and neighborhood perception shed light on the potential significance of perceived TIG, the perception

of adverse neighborhood changes among residents, and its impact on the health behaviors and health of current residents regardless of whether they stay or leave their neighborhood. Changing variables, such as proximity to transit stops, housing type, education levels, population density, as well as, cultural phenomena can all be indicators of TIG progress. To further recognize the latter, cultural displacement, another aspect of gentrification that is often subtle and underappreciated, refers to class- and race-based changes in amenity types, such as local establishments. Chain stores and restaurants often instigate a loss of cultural identity and sense of the place in neighborhoods populated predominantly by people of color. In Portland, OR, long-term African American residents experienced a profound change and alienation from new retail spaces on a gentrifying commercial main street[58]. Unlike other social and economic processes, TIG often takes on specific dimensions locally or regionally, and therefore a universal measurement of TIG is highly improbable[59]. Perceived TIG, such as through the observation of increasingly more affluent residents moving into the neighborhood or through the presence of more police surveillance, can impart negative health outcomes primarily due to the unknown of "if" and "when" "it" (e.g., rent increase leading to a forced eviction/move) will happen.

MENTAL HEALTH CONSEQUENCES

Mental health outcomes, including an increased risk of psychological stress levels, anxiety and depression, have also been demonstrated among displaced populations[36, 44, 46]. The mental health impact related to social loss or the disruption of long-time residential ties and the sense of community diminishment could deteriorate a neighborhood's resilience by weakening social networks[41, 60, 61]. Fear of displacement can heighten anxiety and result in increased mortality[46, 62]. High residential turnover and disruptive impacts of resettlement have been found to be

negatively related to lower self-rated health due to the loss of gathering spaces and institutions. Also, displaced residents have reported higher levels of anxiety due to changes in neighborhood character, feeling unwelcomed, and social isolation, all likely due to a loss of community[29, 63-65]. Specifically, sense of community, a social psychology concept, is defined as a sense of belonging both on a geographical (e.g., neighborhoods) and a relational (e.g., human relationships) scale[66, 67]. This concept, which leads residents to perceive and associate a strong identity with a particular setting, has been found to be an integral contributor to one's neighborhood commitment, involvement, and satisfaction[66, 68]. Leveraging findings from psychology of place research, it can be theorized that when the four basic sense of community elements ((1) membership; (2) influence; (3) integration and needs fulfillment; (4) shared emotional connection) are threatened by displacement, anxiety and depression may ensue[40, 69]. For example, in a cross-sectional study examining the impact of residential displacement on mental health within gentrifying and non-gentrifying neighborhoods from 2010 to 2014, displaced residents were more likely to be diagnosed with mental health-related conditions (37% vs. 18%) compared to residents who were not displaced[46]. Another study showed that the stress of displacement among incumbent residents resulted in poor mental health, including anxiety and depression for 84% of men and 91% of women in a gentrified neighborhood[70]. Likewise, a repeated cross-sectional study determined that worsening neighborhood perceptions were associated with small increases in depression[71]. Again, perceptions were found to impart a negative health outcome. Yet, given all the research, it still is not well known if these mental health outcomes, or even increased CVD risk, are more likely to occur among current residents with poor or good health.

SOCIAL DETERMINANTS OF HEALTH CONSEQUENCES

The relationship between TIG perception and social determinants of health (SDOH), or rather, factors that contribute to health, including the conditions of birth, growth, living, learning, working, playing and aging, has been less understood[72]. Research has shown that the availability of affordable housing, increase of walkable streets, as well as, a reduction in crime are SDOH related to gentrification and, more specifically TIG[44, 46]. Although the presence of walkable streets during the construction period of TOD may be limited, the use of LRT after construction has been found to be associated with an increased likelihood of walking[73]. A cross-sectional analyses reported that both men and women who reported a positive neighborhood change inconvenience were twice as likely to increase their walking afterwards[74]. In regard to rates of crime and gentrification, this relationship has yielded inconclusive findings over the past several decades. A time-series analysis of crime rates between 1970 and 1984 in 14 gentrified neighborhoods throughout Boston, MA; New York, NY; San Francisco, CA; Seattle, WA and Washington, DC indicated some eventual reduction in personal crime rates, but that there was no significant effect on property crime rates[75]. Despite the crime type, the direct relationship between fear or perception of neighborhood crime and community composition change, have affirmed the characteristics of gentrification[76, 77]. Furthermore, when areas have gentrified and changed economically, police surveillance has increased and "created conditions" for more "behavior misconduct" or behaviors that were previously considered normal, but that are now viewed as miscreant or suspicious among the newcomers[78]. Although the relationship with TIG perception and SDOH may have varying directions of association, it is hypothesized that perceived TIG among current residents will be significantly related to walkability changes and to changes in crime within the neighborhoods.

Gauging Effects of Neighborhood Trends and Sickness

THE GENTS STUDY

While some health outcome and SDOH changes have been found to be associated with gentrification and specifically displacement, there is a paucity of data examining the health impacts related to TIG perception. Furthermore, prior research utilized existing data and examined health outcome relationships retrospectively. The GENTS Study (Gauging Effects of Neighborhood Trends and Sickness: Examining the Perceptions of Transit-Induced Gentrification in Prince George's County) will address these limitations by using a longitudinal research framework at the neighborhood level in order to examine health impacts related to TIG perception. Grounded in the previously discussed research and adapted from a study examining gentrification in the San Francisco, CA area, the GENTS Study conceptual model of perceived gentrification and health theorizes that TOD, such as a new light rail line, can lead to both TIG and perceived TIG (Figure 1)[79]. Instigated by any actual or perceived changes in the economic (e.g., increased taxes), social (e.g. perceived crime increase), built (e.g., new sidewalks), or natural (e.g., new parks) environments, as a result of the TOD, perceived TIG, by way of TIG or not, may be capable of influencing positive (e.g., walking) or negative (e.g., smoking) health behaviors. Ultimately, these health behaviors can bring about positive or negative health outcomes (Figure 1 – orange arrows). Furthermore, it is theorized that perceive TIG can directly impact health outcomes. For example, if an individual observes an inflation of new neighbors, s/he may perceive a social environment change, which may bring about a level of anxiety (negative health outcome) or initiate smoking (health behavior), which may result in hypertension (negative health outcome). Conversely, if an individual's neighborhood has undergone construction for new sidewalks leading to the TOD, s/he may begin walking (health behavior), which may reduce hypertension (positive health outcome).

Leveraging an expansion of the Washington DC Metropolitan Area Transit Authority System as a natural experiment, the GENTS Study will add novel and unexplored evidence on the neighborhood, health and TIG effects of a TOD within Prince George's (PG) County, Maryland during the construction period and before operation of the Purple Line (PL) LRT. In Spring 2022, the PL, a 16.2-mile LRT line, will begin operation in PG County, a suburban area of Washington, DC, comprised of over 80% African American and Hispanic residents[80]. The GENTS Study will take advantage of this natural experiment and evaluate PL LRT-related neighborhood changes and associated health impacts of perceived TIG among PG County adults in a quasi-experimental case-comparison group design involving cases living close to the PL LRT vs. controls living father from the PL LRT, but who are similar demographically and in the initial built environment with two points of data collection (e.g., wave 1 and wave 2). Although "case-comparison" contrasts to the "case" and "control" definitions in traditional epidemiology, here case-comparison is defined as a study which compares a group receiving a built environment change or intervention (e.g., PL LRT) to a comparison group that is not directly receiving the built environment change because of proximity or distance[81]. Overall, the research question presented with this GENTS Study is whether or not neighborhood perceptions, in the form of perceived TIG, can have deleterious effects on anxiety and CVD risk despite the initial health status of the current residents.

QUASI-EXPERIMENTAL DESIGN

Approximately 20 pre-post natural experiment studies of a built environment change exploring longitudinal impacts have been conducted in the United States[82-84]. Among these, only a few studies examined the impact of a new LRT, and the participant samples of all but one study consisted of over 70% White and non-Hispanic adults[73, 84-88]. The one study was composed of

45% African Americans, but there were over 90% non-Hispanic adults[89]. Since it has been established that impoverished neighborhoods and communities of color often bear the brunt of unintended TOD impacts, there is an urgent need to establish the effects of a built environment modification and specifically a major transportation infrastructure change on perceived TIG and associated health outcome and SDOH changes among this population. Natural experiment studies are more generally susceptible to bias due to their quasi-experimental design, however the GENTS Study presents a unique opportunity to examine unintended TOD impacts before the operation of a new LRT and among a predominate community of color. When these natural experiments are designed appropriately, it is achievable to preserve and maintain the level of internal and external validity. Preexisting neighborhood preference, choice and residence, and the lack of randomization for the intervention (PL LRT) could pose some degree of individual-level bias via confounding (internal validity). Yet, the amount of bias associated with confounding will be minimized by using a quasi-experimental interrupted time series with comparison group design (Figure 2). While the initial and unique focus of the GENTS Study occurs before the "interruption" or PL LRT intervention through the collection of case and comparison group data at two time points, this study will ultimately collect data after the interruption. Also matching intervention and control groups can be challenging in a natural experiment, but for this study the comparison and control participants will be as similar as possible through the use of analytical methods at baseline (see Data Analysis).

GENTS Study Aim I: Compare Perceived TIG with Health Outcome Changes

For this first aim, the GENTS Study will assess the association of perceived TIG with measured health outcome changes ((Ia) anxiety; (Ib) CVD risk) among PG County adults while also

comparing these associations between case and comparison participants. At two pre-PL LRT data collection points, perceived TIG, and both health outcomes measures will be examined. Perceived TIG, anxiety, and CVD risk will be assessed in order to examine changes in perceived TIG with changes in health outcomes. The objective of this aim is to determine whether the impact of perceived TIG (e.g., negative neighborhood changes) will have an impact on health outcomes and if these impacts vary between case and comparison residents.

GENTS Study Aim II: Compare Perceived TIG with SDOH Changes

The GENTS Study will assess the association of perceived TIG with SDOH changes, including measured ((IIa) walkability, (IIb) crime), and perceived ((IIc) walkability; (IId) crime), and compare these associations in case and comparison participants at two pre-PL LRT data collection points. This aim is not suggesting that perceived TIG will lead to changes in walkability or crime. However, if there are changes in measured or perceived walkability or crime, which are often byproducts of TIG, then it would be expected that changes in perceived TIG would be observed.

METHODS AND ANALYSIS

Purple Line Light Rail Line

Under the Maryland Transit Administration (MTA) leadership, the 16.2-mile PL LRT is anticipated to open for operation in late 2022[90]. However, it was announced late 2019, that the line would open in two phases. The first segment carrying passengers in PG County will open in late 2022 and the remainder of the line will open in 2023. The PL LRT, which began construction in 2016, will extend east from Bethesda (Montgomery County) to New Carrolton (PG County) and connect to existing Red, Green, and Orange Metrorail lines of the Metro System (Figure 3)[91].

Within PG County, there will be a total of 11 stops/stations, including five stops that will be located directly on or adjacent to the University of Maryland (UMD) campus. PL LRT will operate mainly in dedicated lanes and will also connect to MARC, Amtrak, and local bus services. It will consist of quietly operated modern streetcars powered by overhead wires with neighborhood stations convenient for pedestrians[90]. The PG County portion of the PL LRT will be bookended by the Takoma Langley Transit Center and New Carrolton Metrorail stop. The entire PL LRT will connect PG County with Montgomery County, one of the most affluent areas in the United States, and an attraction for employment and entertainment. Areas around the new PL LRT stations/stops in PG County will experience infrastructure changes, new housing, retail development, and the construction of a bike path through the UMD Campus[90].

Study Design and Setting

As a supplement to the existing Purple Line Impacts on Neighborhood, Health and Transit (PLIGHT) Study, which is focusing on changes in physical activity, active transportation, obesity and obesity related-CVD, the GENTS Study will examine the TIG perception and its relationship to health outcome and SDOH changes in the pre-PL LRT period[92]. The GENTS Study will use a quasi-experimental case-comparison design to evaluate PL LRT related neighborhood changes and associated health impacts of perceived TIG among PG County adults by collecting data at two points of time. The intervention site will consist of case residents within a 1-mile network buffer around the PL LRT stations/stops in PG County. The 1-mile network buffer was chosen because it includes a comfortable walking distance and supports research indicating that individuals are willing to walk to reach transit beyond the frequently cited 0.25-to-0.50-mile demarcation[93-100].

Comparison residents will consist of individuals living greater than 1-mile but less than 5-miles from the PL LTR stations/stops (Figure 4).

Patient and Public Involvement

Participants or the public were not involved in the design, conduct, reporting, or dissemination plans of this research.

Participant Recruitment and Study Population

A rolling recruitment and enrollment strategy will be used with three questionnaire deployment pathways over a 12-month wave (Wave 1 – August 2020 to July 2021) in order to achieve a baseline sample. Once achieved, the second data collection point will occur during a second 12-month wave (Wave 2 – August 2021 to July 2022). Questionnaire deployment pathways [(A) Snowball Sampling; (B) On-Site Sampling; (C) Email Blast Sampling] will cast the initial recruitment net from the PL LRT catchment area. Eligible participants must be an adult (18 years and older) and a PG County resident. Individuals will not be eligible to participate if they (a) have a physical impairment, disability, or medical condition that prevents them from engaging in normal daily activities; or (b) are planning to relocate away from the study area and/or PG County within 36 months from the study baseline. Therefore, UMD students will be excluded. For each of the two waves of data collection, participants will be offered a $25 gift card.

To determine the required number of participants, four assumptions for the sample size calculation were used: (1) the attrition from wave 1 to wave 2 data collection is 9%; (2) equal sample sizes between case and comparison groups at baseline (wave 1); (3) power of 0.9; (4) correlation between multiple measurements within a participant is between 0.5 and 0.8; and (5)

minimum detectable effect size of 0.3 standard deviation units of PL LRT use at the second data collection. Therefore, a total of 800 participants at baseline based on these assumptions is required. Each participant's home address will determine if s/he is a case or comparison participant. During recruitment, the demographics of the participant sample will be continually evaluated to maintain its representation. If required, additional targeted recruitment will be initiated to ensure demographic consistency and adequate case and comparison representation. Also, as data are collected, researcher-to-participant contact will be maintained with birthday messages, reminders, study newsletters, and update emails of the GENTS Study.

GENTS Study Questionnaire

QUESTIONNAIRE DEPLOYMENT

Qualtrics.com will host the online GENTS Study questionnaire in English and Spanish (Supplemental Material 1). Forward and backward translation validation will occur for the Spanish language questionnaire. Three questionnaire deployment pathways will be used on a rolling basis. The first deployment pathway will occur through snowball sampling with community partnerships, referrals from participants, and mining community email databases (e.g., PG County Department of Parks and Recreation). Community outreach efforts, such as distributing informational quarter cards to recreational community centers and publishing announcements in local circulars with the GENTS Study website and questionnaire link, will be employed to recruit a representative sample and target underrepresented populations. The second deployment pathway will occur through on-site sampling. GENTS Study researchers will attend community events (e.g., farmer's markets), equipped with iPads for participants to begin questionnaires in person, and show how individuals can complete the questionnaire on their smartphones since Qualtric.com provides a very user-

friendly smartphone platform. According to Pew Research Center, nearly all Americans (96%) now own a cellphone[101]. For individuals who are unable to complete the questionnaire on-site, and in light of the Coronavirus Disease 2019 (COVID-19) pandemic and social distancing guidelines (see Discussion), GENTS Study informational quarter cards will be distributed with the website and questionnaire link. Finally, the third deployment pathway will occur through email blast sampling with the Alesco Data Group, a direct marketing services company that draws from a consumer database of over 149 million addresses in the United States[102]. This third pathway will begin with the purchase of 10,000 PG County household email addresses matched with resident name and postal address within the GENTS Study catchment area for the recruitment of case and control participants. Invitational questionnaire links will be emailed to all 10,000 addresses. While recruitment will occur through three questionnaire deployment pathways as previously described, for the third deployment pathway, we anticipate an 5% response rate, resulting in a sample of approximately 500 (250 cases; 250 comparisons), based on prior research within this regional population[103, 104]. Predictions about the sample size generated from the other pathways cannot be estimated at this time, however, as mentioned previously a total of 800 participants at baseline is required.

Questionnaire Measurement

TIG is a phenomenon that may occur rapidly at times, and the GENTS Study will examine TIG perception during the pre-PL LRT period. It is essential to capture information on individual perceptions and examine how or why those perceptions may or may not change. Perceived TIG will be assessed through the questionnaire. Findings from previous TIG research identifying gentrification indicators, as well as the qualitative data collected for the PLIGHT Study, will

inform the development of these questionnaire items[92]. Specifically, the Neighborhood Change and Gentrification Scale (NCGS), a ten item scale using a five-point Likert response rating of agreement, created and developed by researchers in the social service field will, be used to assess perceived TIG[105]. Four of the NCGS items were developed based on prior research using census-based measures of neighborhood gentrification (e.g., "I have seen an increased influx of affluent and nonminority residents moving into the neighborhood."). The other six items were drawn from qualitative and quantitative self-reported research experiences on gentrification (.e.g. "I have feared being "pushed out" of my neighborhood." In addition, demographic information (e.g., race, ethnicity, age) and other relevant information, such as housing tenure, homeownership, transit, commuting patterns, and physical activity behaviors will also be collected as these data may influence TIG perception (Supplemental Material 1).

Sense of community, as well as anxiety, will be assessed using the Sense of Community Index Version Two (SCI-2) and Kessler Psychological Distress Scale (K10), respectively. SCI-2, an instrument bridging the public health, environmental psychology, engineering, and design fields, demonstrates high reliability with strong validity[106, 107]. Furthermore, K10 is a reliable and valid 10-item questionnaire providing a global measure of distress based on questions about anxiety and depressive symptoms experienced in the most recent month[108].

Even though CVD generally includes heart conditions involving diseased vessels, structural problems, and blood clots, capturing each and every type of stage of CVD is not only impractical, but it also would not necessarily identify early disease stage individuals. Therefore, changes in hypertension, one of the strongest risk factors for almost all different types of CVD, will be used as the primary metric for CVD risk[55]. Questionnaire items assessing hypertension and CVD prevalence will be adopted from the National Health and Nutrition Examination

Survey (NHANES). Additionally, questions from the Framingham Heart Study will be used to ask about key traditional CVD risk factors.

Changes in actual walkability will be examined in two ways. First, components of walkability, including street connectivity, infrastructure for walking, neighborhood aesthetics, traffic, and crime safety, will be assessed with the Neighborhood Environment Walkability Survey – Abbreviated (NEWS-A)[109]. Second, WalkScore, a large-scale, publicly available index that assigns a numerical walkability score to any address in the United States, will also assess changes in walkability through PG County neighborhoods[110]. Perceived walkability will be assessed through items previously used in validated instruments[111].

Finally, changes in personal and property crime rates will be examined. Data on assaults, burglaries, homicides, robberies, sex offenses, stolen vehicles, thefts, and vandalism will be obtained from the PG County Police Department data. These data will be geographically mapped so that spatial and temporal changes in crime can be assessed. With PG County Police Department being the fourth largest law enforcement agency in the State of Maryland and within a demographically and geographically diverse area, enforcement patterns will also be examined as these patterns can influence crime distribution throughout the county. Trends in offense type by age, race, ethnicity, gender and geography will be considered based on the availability of data[112]. Finally, perceived crime will be assessed through questionnaire items previously used in validated instruments[111].

Data Management and Analyses

Throughout the course of the GENTS Study, data will be downloaded from Qualtrics.com and managed on a secure and password protected UMD sever. All non-electronic data will be stored

in a locked file cabinet that is located in the swipe card and key accessed PHOEBE Lab of the Principal Investigator (Roberts). Visualizations and descriptive statistics will examine data distributions, identify category thresholds, outliers, and missing values, and audit data for any problems with the planned statistical methods. Variables may be transformed or analogous non-parametric tests used if statistical assumptions are severely violated. The population representativeness of the sample and comparability between case and comparison groups will be evaluated. As missing data problems arise, sensitivity analyses will evaluate statistical tests for robustness.

Between group analysis (e.g., cases vs. comparisons) will be performed to address sources of bias and strengthen the causal inferences from this natural experiment. To help adjust for any potential variation in the characteristics of the case vs. comparison groups at baseline various analytical methods (e.g. propensity score matching) will be used. Initially, t-tests among cases and comparisons and longitudinally will be conducted. Paired t-tests will be used to compare health outcome and SDOH changes within the two pre-PL LRT periods. Plus, latent growth curve (LGC) modeling will assess health outcome and SDOH changes [113]. This technique can model linear and curvilinear relationships and incorporate other statistics to determine if the hypothesized models adequately fit the observed data[5, 113]. LGC can be structured as a piecewise model, such that discrete periods of time can have markedly different slopes[114]. LCG can accommodate latent or unobserved factors and can handle both time-variant (e.g., neighborhood perceptions) and invariant (e.g., race/ethnicity) variables[115]. There is no requirement that there be more than two measurements or that the measurement times be equally spaced[116]. Also, individual times of observation are allowed to vary. Potential confounders will be identified and measured as well as

contextual variable threats (e.g. sociodemographic variables) to external validity (generalizability) and then adjusted for these modelling approaches.

For Aim I, LGC modeling will first construct unconditional LGC measurement models, in which perceived TIG and psychological stress are each modeled only as a function of time[113, 117, 118]. If a linear model is not satisfactory, alternative curvilinear models can be specified and tested. Since this aim seeks to determine Wave 1 vs. Wave 2 PR LRT effects, a piecewise growth model may also be specified[114]. This approach may be appropriate if a sharp initial increase in perceived TIG and anxiety in the months closer to the PL LRT opening are observed. Second, if substantial individual variance around the mean growth curve is observed in the unconditional model, the growth factors (the latent slope(s) and intercept) will be regressed on exogenous explanatory variables in a conditional LGC model[117, 118]. For Aim I, the primary explanatory variable is whether or not a participant resides in the PL LRT intervention (case vs. comparison area). This takes the general form of $\eta_i = \pi + \gamma X_i + \beta_i T_i + \varepsilon_i$, where $\underline{\eta_i}$ is a J x 1 vector of latent growth factors, $\underline{\pi}$ is a J x 1 vector of regression intercepts, X_i is a K x 1 vector of covariate variables, $\underline{\gamma}$ is a J x K matrix of regression coefficients, $\underline{T_i}$ is the intervention indicator variable, $\underline{\beta_i}$ is the coefficient for the treatment indicator variable, and $\underline{\varepsilon_i}$ is a J x 1 vector of residuals, which has a multivariate normal distribution accounting for the within-subject correlation. If the change over time in perceived TIG and anxiety is different in the case participants exposed to the new PL LRT line compared to the comparison participants not exposed, an understanding of this phenomenon can be achieved by regressing the growth factors on the PL LRT case vs. comparison condition (located in the x vector). The x vector contains covariates, such as sex, race, age, and propensity scores. This modeling application will be repeated to model CVD risk, specifically hypertension. Furthermore, this modeling approach will be repeated for Aim II in order to model the association of walkability

and crime with perceived TIG while also comparing these associations between case and comparison participants.

DISCUSSION

This natural experiment is one of only a few to investigate the relationship between perceived TIG, health outcomes and SDOH in a predominant community of color. The diversity of the PG County Study population is a unique feature of this research especially considering the fact that the African American proportion of similar studies performed in Philadelphia and California was only 22% and 5.6% respectively[62, 119, 120]. The inclusion of these underrepresented populations is crucial to the validity of the study results, but more importantly adequate representation of the GENTS Study is essential to address the research questions and policy issues that are specifically tailored to PG County.

This research will add to the growing body of literature and urgency suggesting that plans to invest in transportation infrastructure can impact the health of the residents even before the infrastructure is in place. There has been very little research on whether different phases of LRT construction, independent of public investments and regulations, have any effect on the gentrification process and/or the health of residents. One approach to exam this issue is to observe and evaluate how residents and other community stakeholders respond to TOD plan announcements. As an example, one of the main questions posed by Knaap, Ding, and Hopkins was "Do Plans Matter?". It was found that plans do indeed matter when the plans for LRT investments increased the land value in proposed station areas[121]. Most recently National Public Radio published an article entitled "How To Limit Gentrification Along The Purple Line, According To Housing Advocates" where is was stated that "Apartment dwellers in Langley Park,

Maryland, are at risk of rent hikes as the Purple Line spurs development in the area"[122]. A plan from the Purple Line Corridor Coalition, a group of nonprofit leaders, planners, developers and others convened by UMD's National Center for Smart Growth to advise local leaders and organizations, recommends actions to preserve affordable housing and reduce displacement along the path of the PL LRT, which is expected to transform economically distressed neighborhoods[122]. Since gentrification is a dynamic process, it is necessary to compare regional changes over time and space. The GENTS Study will identify changes over time in perceived TIG, health outcomes and SDOH among case and comparison residents before the completion and operation of the PL LRT, an under researched period of TOD. Furthermore, this research will be able to capture evidence as to the effectiveness of the Purple Line Corridor Coalition plan.

While strengths of this study lie in the diversity of the study population as well as the timing of the natural study, it is important to recognize possible challenges. It is expected that recruitment efforts may take a longer period of time considering that recruitment will occur within in a predominately African American and Hispanic population who may have a strong hesitancy and an overarching sense of distrust with research participation[123-125]. Maryland has a large immigrant population (15.2%) and over 27% are undocumented and are centered in PG County[126, 127]. As such, time is needed for community engagement in order to demonstrate trustworthiness and commitment. Additionally, retention efforts will need to be robust through consistent participant communication and community visibility of the GENTS Study. Furthermore, that launch of the GENTS Study is occurring during an exceptionally remarkable period of time. Since the early part of this year, the COVID-19 pandemic has significantly devastated communities worldwide. In order to adapt to the new challenges of social distancing and living through a disease outbreak, the questionnaire deployment pathways will physical human interaction (e.g., on-site sampling) may need to be

temporarily modified. Also, COVID-19 risk perception questions will be added to the questionnaire. These questions will examine COVID-19 risk perceptions in general and as related to public transit. While the online questionnaire will generally ask respondents about outcomes, perceptions, attitudes and behaviors within the past months (Supplemental Material 1), the COVID-19 risk perception of transmission, disease and death may have a sustaining impact for years to come. Moreover, the focus of the GENTS Study is related to public transit and the forthcoming PL LRT. Public transit has been scrutinized as an optimal source and environment for COVID-19 transmission and as such ridership has dwindled in many cities[128]. A recent study found that public transportation users perceived a greater COVID-19 risk exposure compared to personal vehicle users and those who walked[129]. Despite these limitations and unexpected events, it is anticipated that the GENTS Study will contribute significantly to the research field and fill gaps in the literature on the health and well-being impacts of TIG. Moreover, findings from this research will be able to address research questions and policy issues that are specifically tailored to PG County while also providing more effective procedural solutions for other regions undergoing TOD and TIG risk.

ETHICS AND DISSEMINATION

Ethics Approval and Consent to Participate

The Institutional Review Board at The University of Maryland at College Park has approved this study protocol (Supplemental Material 2). Information about the GENTS Study will be provided at the beginning of the questionnaire. This information will be written at a reading level that is easily understood by all, indicating that participation is voluntary, that he/she is free to withdraw participation any time without penalty, a description of measures that will be taken to ensure

privacy, and how the results will be used. Adult participants will be required to click a button to acknowledge that they have read the study information and then informed consent will be obtained upon questionnaire completion. The informed consent form will be returned electronically with the questionnaire. Participants will be instructed to print or email a copy for their records.

Competing Interest

The authors declare that they have no competing interests.

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Authors' Contributions

JDR conceived and designed the GENT Study. JDR wrote and drafted the manuscript with SOT. EAS and RI edited components of the manuscript. VNG provided methodology expertise for the study design. MLB provided GIS expertise and created the GENT Study map. All authors have read and approved the manuscript.

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FIGURE LEGENDS

Figure 1 – Perceived Gentrification and Health Outcome Model
Figure 2 – GENTS Study Design
Figure 3 – MTA Purple Line Map
Figure 4 – GENTS Study Area

SUPPLEMENTAL MATERIAL

Supplemental Material 1 – GENTS Study Questionnaire
Supplemental Material 2 – GENTS Study IRB Approval

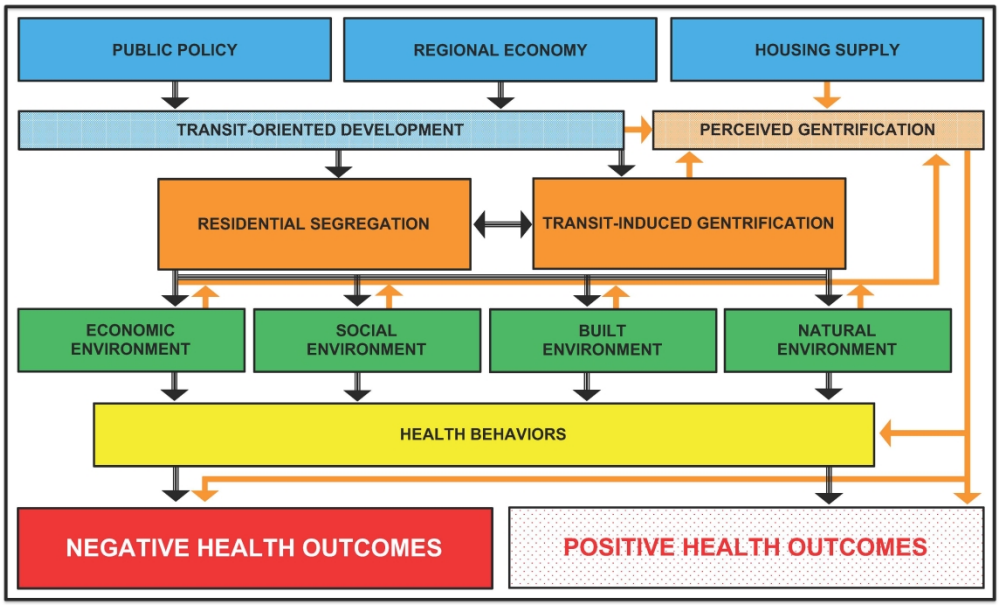


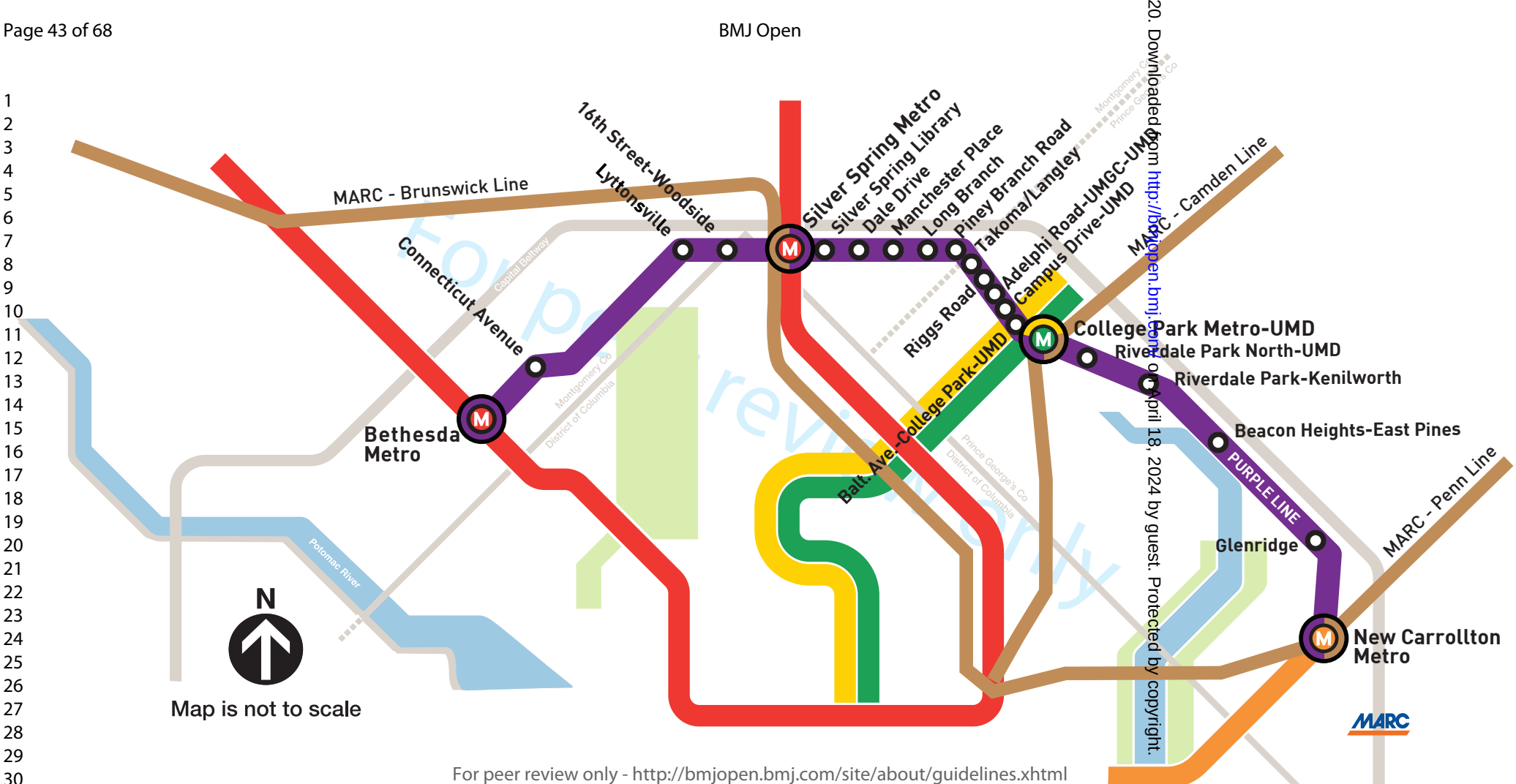
Figure 1 – Perceived Gentrification and Health Outcome Model

1447x873mm (72 x 72 DPI)

GENTS Study					
Study Groups	T-2 Wave 1 Data Collection	T-1 Wave 2 Data Collection	Treatment	T+1 Wave 3 Data Collection	T+2 Wave 4 Data Collection
Case Participants	August 2020 to July 2021	August 2021 to July 2022	Purple Line Light Rail Transit <1-mile network	To Be Determined	To Be Determined
Comparison Participants	August 2020 to July 2021	August 2021 to July 2022	Purple Line Light Rail Transit >1-mile network	To Be Determined	To Be Determined

Figure 2 – GENTS Study Design

342x82mm (200 x 200 DPI)



Source: Maryland Transit Administration

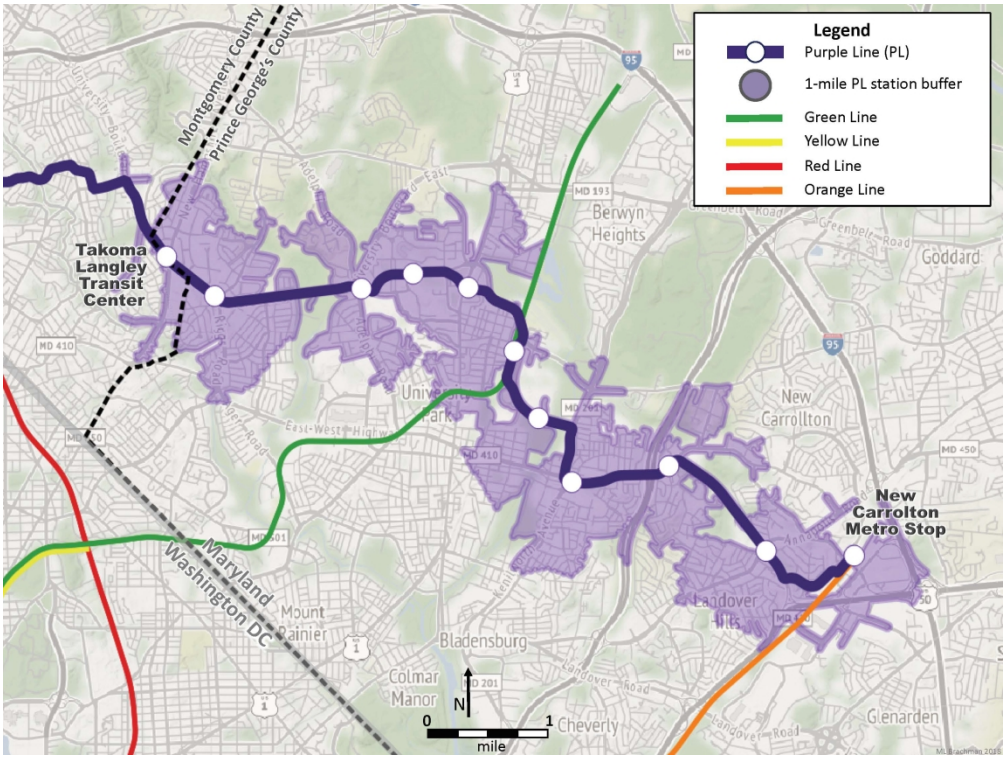


Figure 4 – GENTS Study Area

1057x793mm (72 x 72 DPI)

Gauging the Effects of Neighborhood Trends on Sickness

QUESTIONNAIRE

GENTS

GAUGING THE EFFECTS OF NEIGHBORHOOD TRENDS ON SICKNESS: EXAMINING PERCEPTIONS OF TRANSIT-INDUCED GENTRIFICATION IN PRINCE GEORGE'S COUNTY

STUDY

Thank you for participating in the GENTS Study.

Dr. Jennifer D. Roberts, along with her PHOEBE Laboratory research at the University of Maryland, is conducting the GENTS Study to examine gentrification and its impact on health and well-being among Prince George's County residents. We would greatly appreciate it if you could complete this questionnaire as soon as possible. It should take about 30 to 60 minutes to complete. Feel free to stop and take breaks as needed. Upon completion, you will receive your $25 gift card.

Here are a few things to keep in mind while working on the questionnaire:

- All your responses are completely confidential. They will not be seen by anyone except researchers at the University of Maryland. Responses to your questions will be grouped with the responses of others.
- Please answer each question as accurately and honestly as possible.
- Once you have finished, please double check to make sure you didn't miss any questions.
- Your participation in completing this questionnaire is voluntary and you can stop at any time.

Again, thank you for completing this questionnaire and participating in the GENTS Study. If you have any questions, please feel free to contact us by phone or email.

Principal Investigator: Dr. Jennifer D. Roberts
Phone: 301-405-7748
Email: gentsstudy@umd.edu

1. What is today's date? _____(Month) _____ (Day) _____(Year)

QUESTIONS ABOUT YOU AND YOUR BACKGROUND

2. What is your gender? □ Male □ Female

3. Which of the following describes you? *(check all that apply)*
   - □ Hispanic or Latino
   - □ Black or African American
   - □ White
   - □ American Indian or Alaskan Native
   - □ Asian or East Indian
   - □ Native Hawaiian or other Pacific Islander
   - □ Other *(specify)* _____

4. What is your birth date? _____ (Month) _____ (Day) _____ (Year)

5. What is your height? _____ (Feet) _____ (Inches)

6. What is your weight? _____ (Pounds)

7. Where you born in the United States? □ Yes □ No

8. What language do you speak most of the time at home?
   - □ English
   - □ Spanish
   - □ Other *(specify language)* _____
   - □ About the same in Spanish and English
   - □ About the same in another language and English *(specify Language)* _____

9. What is your current relationship status?
   - □ Married
   - □ Separated
   - □ Never married
   - □ Divorced
   - □ Widowed
   - □ Living with partner, not married

10. Including yourself, how many people live in your household? _____

11. Are you raising children? □ Yes □ No
    If YES: What is your relationship to these children?
    - □ My own
    - □ My grandchildren
    - □ Other's children

    How many children live with you that you are raising? _____

    What are the ages of the children who live with you? _____ _____ _____ _____ _____ _____

12. What is the highest grade of school or year of college you have completed?
    - □ Less than high school diploma / GED
    - □ High school diploma / GED
    - □ Some college, no degree
    - □ Associates or Technical degree
    - □ Bachelor's degree
    - □ Graduate or professional degree

13. What is the name of your neighborhood? _____

14. Are you planning to move in the next 12 months?
□ Yes, within the DMV area □ Yes, outside the DMV area □ No □ I don't know

15. What is your current home address?
Neighborhood: _____
Address: _____
City: _____ State _____ Zip _____

16. How long have you lived at your current home address? _____ Years _____ Months

17. Where did you live before you moved to your current home address? *(provide as much information as you can remember)*
Neighborhood: _____
Address: _____
City: _____ State _____ Zip _____
(If you don't know the exact address) Nearby cross streets: _____ & _____

18. Do you own or rent the place where you live? □ Own □ Rent

19. Do you live in a:
□ Manufactured / Mobile home □ Single Family home
□ Townhouse / Duplex /Attached in-law suite □ Apartment complex
□ Dorm room / fraternity / sorority house □ Other *(specify)* _____

20. What category best describes your average monthly mortgage or rent *(not including utilities)*?
□ $0 to $500 □ $501 to $1,000 □ $1,001 to $1,500 □ $1,501 to $2,000 □ $2,001 or more □ I don't know

21. Do other adults *(age 18 or over)* in the household work for pay? □ Yes □ No □ No other adults in the household

22. What category best describes your annual household income? *(pre-tax earnings from household members earned in the last 12 months)*
□ Under $20,000 □ $20,000 to $39,999 □ $40,000 to $59,999 □ $60,000 to $79,999
□ $80,000 to $99,999 □ $100,000 to 124,999 □ $125,000 to $149,999 □ Over $150,000
□ I don't know

QUESTIONS ABOUT YOUR NEIGHBORHOOD AND THE PURPLE LINE

As you may know, Maryland Transit Administration (MTA) is planning to open one new light rail train line (MTA Purple Line) within the DMV in 2022. This 16-mile light rail line will operate from Bethesda in Montgomery County to New Carrollton in Prince George's County. You were selected to participate in this study because you live in Prince George's County.

23. When the new MTA Purple Line opens, do you intend to use it? □ Yes □ No

24. Will you use this new MTA Purple Line for the following purposes?
Travel to work or school □ Yes □ No □ Not Sure

Daily or weekly shopping, such as grocery and/or pharmacy trips	□ Yes	□ No	□ Not Sure
Trips and errands, such as to the doctor or occasional shopping	□ Yes	□ No	□ Not Sure
To reach physical activities, such as a park or gym	□ Yes	□ No	□ Not Sure
To reach recreational activities, such as a movie theater or restaurant	□ Yes	□ No	□ Not Sure
To reach social activities, such as going to a friend's house	□ Yes	□ No	□ Not Sure

25. How much do you disagree or agree with the following statements? *(check one response for each statement)*

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know or Not Sure
I feel that I belong in my community or neighborhood	☐	☐	☐	☐	☐
I have a strong sense of purpose in my neighborhood	☐	☐	☐	☐	☐
I have a voice in my neighborhood	☐	☐	☐	☐	☐
I am trusted and trust my neighborhood	☐	☐	☐	☐	☐
I feel that I bring something of value to my neighborhood	☐	☐	☐	☐	☐
I feel emotionally connected to members in my neighborhood	☐	☐	☐	☐	☐
I participate in activities in my neighborhood	☐	☐	☐	☐	☐
I feel like I belong when I ride the DMV METRO bus or train	☐	☐	☐	☐	☐

26. The opening of a new MTA Purple Line may bring changes to your neighborhood. Please indicate whether the following items will decrease, stay the same, or increase **as a result of the MTA Purple Line opening.** *(check one response for each statement)*

	Definitely will DECREASE	Probably will DECREASE	Stay the Same	Probably will INCREASE	Definitely will INCREASE	Don't Know or Not Sure
The time it takes to get around DMV	☐	☐	☐	☐	☐	☐
The time it takes to get to my job or school	☐	☐	☐	☐	☐	☐
The time it takes to get to shops *(e.g., grocery store, bank, pharmacy, laundromat, etc.)*	☐	☐	☐	☐	☐	☐
Crime in my neighborhood	☐	☐	☐	☐	☐	☐
Noise in my neighborhood	☐	☐	☐	☐	☐	☐
Pollution in my neighborhood	☐	☐	☐	☐	☐	☐
Property values and taxes in my neighborhood	☐	☐	☐	☐	☐	☐
New people moving into my neighborhood	☐	☐	☐	☐	☐	☐
New homes, shops, and office buildings built in my neighborhood	☐	☐	☐	☐	☐	☐
Bus service in my neighborhood	☐	☐	☐	☐	☐	☐
Sense of community in my neighborhood	☐	☐	☐	☐	☐	☐

Pleasing appearance of my neighborhood	☐	☐	☐	☐	☐	☐
Crowdedness of street	☐	☐	☐	☐	☐	☐
Amount of litter in my neighborhood	☐	☐	☐	☐	☐	☐
Familiar local or family businesses	☐	☐	☐	☐	☐	☐

27. Please indicate how strongly you disagree or agree with the following statement.

"After the new MTA Purple Line opens, I intend to switch from traveling either by car or by bus to the MTA Purple Line light rail at least some of the time"

□ Strongly Disagree □ Disagree □ Agree □ Strongly Agree □ Don't Know or Not Sure

28. How much of a problem are the following in your neighborhood? *(check all that apply)*

	Not a Problem	**Somewhat of a Problem**	**Big Problem**
Litter/trash in the streets	O	O	O
Graffiti	O	O	O
Vacant housing	O	O	O
Poorly maintained property	O	O	O
Abandoned cars	O	O	O
Drinking in public	O	O	O
Selling or using drugs	O	O	O
Homeless people / street panhandlers	O	O	O
Groups of teenagers hanging out	O	O	O
People fighting / arguing	O	O	O
Exceeding speed limit	O	O	O
Excessive noise & Odors	O	O	O
Other: _____	O	O	O

29. Please indicate how frequently you have worried about becoming the victim of the following crimes in your neighborhood in the past month?

	EVERYDAY	**1-2 Times in Past WEEK**	**1-2 Times in Past MONTH**	**Not Once in Past MONTH**
Being physically attacked by a stranger in the street	O	O	O	O
Being robbed or mugged in the street	O	O	O	O
Being harassed, threatened, or verbally abused in the street	O	O	O	O
Having someone break into your home while you or your family **were there**	O	O	O	O
Having someone break into your home while you or your family **were NOT there**	O	O	O	O

30. This question refers to features of your *current* neighborhood and their importance in selecting a *new* neighborhood if you were to move. With "1" meaning "**Least"** *(Not True or Not Important)* and "4" meaning "**Most**" *(True or Important)*, please rate how well these features describe your *current* neighborhood and how important they are in selecting a *new* one if you were to move. *(circle one response per statement for Current Neighborhood and one per statement for New Neighborhood)*. **Please answer even if you do not plan to move to a new neighborhood in the future.**

	CURRENT NEIGHBORHOOD				NEW NEIGHBORHOOD			
Easy access to regional shopping mall	1	2	3	4	1	2	3	4
Easy access to downtown	1	2	3	4	1	2	3	4
Places such as a pool or a community center nearby	1	2	3	4	1	2	3	4
Shopping areas within walking distance	1	2	3	4	1	2	3	4
Easy access to the freeway	1	2	3	4	1	2	3	4
Connected bicycle routes beyond the neighborhood	1	2	3	4	1	2	3	4
Sidewalks throughout the neighborhood	1	2	3	4	1	2	3	4
Parks and open spaces nearby	1	2	3	4	1	2	3	4
Good public transit service	1	2	3	4	1	2	3	4
Quiet neighborhood	1	2	3	4	1	2	3	4
Low crime rate within neighborhood	1	2	3	4	1	2	3	4
Low level of car traffic on streets	1	2	3	4	1	2	3	4
Neighborhood is safe from traffic for walking	1	2	3	4	1	2	3	4
Neighborhood is safe from crime for walking	1	2	3	4	1	2	3	4
Neighborhood is safe from traffic for kids to play outside	1	2	3	4	1	2	3	4
Good street lighting	1	2	3	4	1	2	3	4
Diverse neighbors in terms of ethnicity, race and age	1	2	3	4	1	2	3	4
Lots of people out and about within the neighborhood	1	2	3	4	1	2	3	4
Lots of interaction among neighbors	1	2	3	4	1	2	3	4
Neighbors of similar economic level	1	2	3	4	1	2	3	4
Attractive appearance of neighborhood	1	2	3	4	1	2	3	4
High level of upkeep in neighborhood	1	2	3	4	1	2	3	4
Variety in housing design and styles	1	2	3	4	1	2	3	4
Big trees on the street	1	2	3	4	1	2	3	4
Large back yards	1	2	3	4	1	2	3	4
Large front yards	1	2	3	4	1	2	3	4
Lots of off-street parking with garages or driveways	1	2	3	4	1	2	3	4

31. How much do you disagree or agree with the following statements? *(check one response for each statement)*

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know or Not Sure
In my neighborhood, it is easy to buy fresh fruits and vegetables	☐	☐	☐	☐	☐
In my neighborhood, it is easy to buy tobacco products	☐	☐	☐	☐	☐
My neighborhood has the best food stores in town	☐	☐	☐	☐	☐
I prefer to shop for food at the local convenience store or corner store	☐	☐	☐	☐	☐
In my neighborhood, it is easy to buy alcohol	☐	☐	☐	☐	☐
The food stores in my neighborhood sell outdated or rotten products	☐	☐	☐	☐	☐
The local convenience store or corner store is expensive	☐	☐	☐	☐	☐
In my neighborhood, it is easy to buy healthy foods	☐	☐	☐	☐	☐

32. Please indicate how you feel to the following statements? *(check one response for each statement)*

	Not at All	Somewhat	Mostly	Completely
I get important needs of mine met because I am part of this community?	☐	☐	☐	☐
Community members and I value the same things	☐	☐	☐	☐
This community has been successful in getting the needs of its members met	☐	☐	☐	☐
Being a member of this community makes me feel good	☐	☐	☐	☐
When I have a problem, I can talk about it with members of this community	☐	☐	☐	☐
People in this community have similar needs, priorities, and goals	☐	☐	☐	☐
I can recognize most of the members of this community	☐	☐	☐	☐
Most community members know me	☐	☐	☐	☐
This community has symbols and expressions of membership such as clothes, signs, art, architecture, logos, landmarks, and flags that people can recognize	☐	☐	☐	☐
I put a lot of time and effort into being part of this community	☐	☐	☐	☐
Being a member of this community is a part of my identity	☐	☐	☐	☐

Fitting into this community is important to me	☐	☐	☐	☐	
This community can influence other communities	☐	☐	☐	☐	
I care about what other community members think of me	☐	☐	☐	☐	
I have influence over what this community is like	☐	☐	☐	☐	
If there is a problem in this community, members can get it solved	☐	☐	☐	☐	
This community has good leaders	☐	☐	☐	☐	
It is very important to me to be a part of this community	☐	☐	☐	☐	
I am with other community members a lot and enjoy being with them	☐	☐	☐	☐	
I expect to be a part of this community for a long time	☐	☐	☐	☐	
Members of this community have shared important events together, such as holidays, celebrations, or disasters	☐	☐	☐	☐	
I feel hopeful about the future of this community	☐	☐	☐	☐	
Members of this community care about each other	☐	☐	☐	☐	

33. How much do you disagree or agree with the following statements? *(check one response for each statement)*

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I have experienced improved access to neighborhood amenities and city services.	☐	☐	☐	☐	☐
I have seen an influx of affluent or non-minority residents moving into the neighborhood.	☐	☐	☐	☐	☐
I have feared being “pushed out” of my neighborhood.	☐	☐	☐	☐	☐
Crime has decreased in my neighborhood.	☐	☐	☐	☐	☐
I have seen a disruption of local community ties and social networks.	☐	☐	☐	☐	☐
I have experienced or heard of others being harassed by their landlords to vacate an apartment.	☐	☐	☐	☐	☐
I have felt increasingly “out of place” in my neighborhood.	☐	☐	☐	☐	☐

I worry about feeling "unwelcome" in my neighborhood.	☐	☐	☐	☐	☐
I have observed changes to the sense of "community" in the neighborhood.	☐	☐	☐	☐	☐
I have observed a lot of renovation activity in the neighborhood.	☐	☐	☐	☐	☐

QUESTIONS ABOUT YOUR STRESS AND ANXIETY

34. These questions concern how you have been feeling over the past 30 days. Tick a box below each question that best represents how you have been.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
During the last 30 days, about how often did you feel tired out for no good reason?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel nervous?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel so nervous that nothing could calm you down?	☐	☐	☐	☐	☐
During the last 30 days, about how often deed you feel hopeless?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel restless or fidgety?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel restless you not sit still?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel depressed?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel that everything was an effort?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel so sad that nothing could cheer you up?	☐	☐	☐	☐	☐
During the last 30 days, about how often did you feel worthless?	☐	☐	☐	☐	☐

35. These questions in this scale ask you about your feelings and thoughts over the past 30 days. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
During the last 30 days, how often have you been upset because of something that happened unexpectedly?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt that you were unable to control the important things in your life?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt nervous and "stressed"?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt confident about your ability to handle your personal problems?	☐	☐	☐	☐	☐
During the last 30 days, about how often have you felt that things were going your way?	☐	☐	☐	☐	☐
During the last 30 days, how often have you found that you could not cope with all the things that you had to do?	☐	☐	☐	☐	☐
During the last 30 days, how often have you been able to control irritations in your life?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt that you were on top of things?	☐	☐	☐	☐	☐
During the last 30 days, how often have you been angered because of things that were outside of your control?	☐	☐	☐	☐	☐
During the last 30 days, how often have you felt difficulties were piling up so high that you could not overcome them?	☐	☐	☐	☐	☐

36. A number of statements which people have used to describe themselves are given below. Read each statement and then circle the number at the end of the statement that indicates how you feel **right now**, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe your present feelings best.

	Not at All	Somewhat	Moderately So	Very Much So
I feel calm	☐	☐	☐	☐
I feel secure	☐	☐	☐	☐
I am tense	☐	☐	☐	☐
I feel strained	☐	☐	☐	☐
I feel at ease	☐	☐	☐	☐
I feel upset	☐	☐	☐	☐

I am presently worrying over possible misfortunes	☐	☐	☐	☐
I feel satisfied	☐	☐	☐	☐
I feel frightened	☐	☐	☐	☐
I feel comfortable	☐	☐	☐	☐
I feel self-confident	☐	☐	☐	☐
I feel nervous	☐	☐	☐	☐
I am jittery	☐	☐	☐	☐
I feel indecisive	☐	☐	☐	☐
I am relaxed	☐	☐	☐	☐
I feel content	☐	☐	☐	☐
I am worried	☐	☐	☐	☐
I feel confused	☐	☐	☐	☐
I feel steady	☐	☐	☐	☐
I feel pleasant	☐	☐	☐	☐

37. A number of statements which people have used to describe themselves are given below. Read each statement and then circle the number at the end of the statement that indicates how you feel **generally**. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe how you generally feel.

	Not at All	Somewhat	Moderately So	Very Much So
I feel pleasant	☐	☐	☐	☐
I feel nervous and restless	☐	☐	☐	☐
I feel satisfied with myself	☐	☐	☐	☐
I wish I could be as happy as others seem to be	☐	☐	☐	☐
I feel like a failure	☐	☐	☐	☐
I feel rested	☐	☐	☐	☐
I am calm, cool and collected	☐	☐	☐	☐
I feel that difficulties are piling up so that I cannot overcome them	☐	☐	☐	☐
I worry too much over something that really doesn't matter	☐	☐	☐	☐
I am happy	☐	☐	☐	☐
I have disturbing thoughts	☐	☐	☐	☐
I lack self confidence	☐	☐	☐	☐
I feel secure	☐	☐	☐	☐
I make decisions easily	☐	☐	☐	☐
I feel inadequate	☐	☐	☐	☐
I am content	☐	☐	☐	☐
Some unimportant thoughts run through my mind and bothers me	☐	☐	☐	☐
I take disappointments so keenly that I can't put them out of my mind	☐	☐	☐	☐
I am a steady person	☐	☐	☐	☐
I get in a state of tension or turmoil as I think over my recent concerns and interests	☐	☐	☐	☐

QUESTIONS ABOUT YOUR HEART HEALTH

Hypertension (High Blood Pressure) is a repeatedly increased blood pressure with the first number 140 or higher and the second number 90 or higher.

38. Have you **ever** been told by a doctor or other health professional that you had hypertension, also called high blood pressure (Please do not include a time you were pregnant)?
□ Yes □ No □ Don't Know

39. Were you told on 2 or more **different** visits that you had hypertension?
□ Yes □ No □ Don't Know

40. How old were you when you were **first** told that you had hypertension or high blood pressure?

YES.....1
NO.....2 (BPQ.080)
REFUSED..... .....7 (BPQ.080)
DON'T KNOW.....9 (BPQ.080)

41. Because of your high blood pressure/hypertension, have you **ever** been told to take prescribed medicine?
□ Yes □ No □ Don't Know

Prescribed Medicine: Prescribed medicines are those ordered by a doctor or other health provider through a written or verbal prescription for a pharmacist to fill. Prescription medicines can also be given by a medical provider directly to a patient to take home, such as free samples.

42. Are you **now** taking a prescribed medicine to lower your high blood pressure?
□ Yes □ No □ Don't Know

43. Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
□ Yes □ No □ Don't Know

Cholesterol is a type of fat in the bloodstream and is measured with a blood test, usually done in the morning before you've eaten. High levels of cholesterol are a major risk factor for heart disease, which leads to heart attack.

44. Have you **ever** had your blood cholesterol checked?
□ Yes □ No □ Don't Know

45. About how long has it been since you **last** had your blood cholesterol checked? Has it been…
□ Less than 1 year ago
□ 1 year but less than 2 years ago
□ 2 years but less than 5 years ago, or
□ 5 years or more
□ Don't know

46. To lower your blood cholesterol, have you **ever** been told by a doctor or other health professional **to take prescribed medicine**?
□ Yes □ No □ Don't Know

47. Are you **now** taking a prescribed medicine to lower your blood cholesterol?
□ Yes □ No □ Don't Know

48. Have you smoked cigarettes regularly since your last physical exam?
□ Yes □ No □ Don't Know

49. If yes to question #46, how many cigarettes do/did you smoke **a day**?
□ 10 cigarettes or less □ 21-30 cigarettes
□ 11 -20 cigarettes □ 31 or more cigarettes

50. Do you drink any of the follow beverages at least once a month?
□ Beer □ Wine □ Liquor/spirits □ Don't consume alcohol

51. What is your average number of alcohol servings in a typical week or month since your last physical exam? Please answer your alcohol intake either weekly or monthly.

Beverage	**Per Week**	**Per Month**
Beer (12oz bottle, glass, can)	_____	_____
Wine (red or white, 40z glass)	_____	_____
Liquor/spirits (1oz cocktail/highball)	_____	_____
□ Check here if you do not consume alcohol		

52. Do you usually have a cough? (Exclude clearing of the throat)
□ Yes □ No □ Don't Know

53. Do you usually have a cough at all on getting u or first thing in the morning?
□ Yes □ No □ Don't Know

If **YES** to either question #50 or 51 above, please answer the following:

54. Do you cough like this on most days for three consecutive months or more during the past year?
□ Yes □ No □ Don't Know

55. How many years have you had this cough? _____ number of years

56. Are you troubled by shortness of breath when hurrying on level ground or walking up a slight hill?
□ Yes □ No □ Don't Know

57. Do you have to walk slower than people of your age on level ground because of shortness of breath?
□ Yes □ No □ Don't Know

58. Do you have to stop for breath when walking at your own pace on level ground?
□ Yes □ No □ Don't Know

59. Do you have to stop for breath after walking 100 yards (or after a few minutes) on level ground?

□ Yes □ No □ Don't Know

60. Have you been told by your doctor you had heart failure or congestive heart failure?
□ Yes □ No □ Don't Know

QUESTIONS ABOUT YOUR NEIGHBORHOOD WALKABILITY

We would like to find out more information about the way that you perceive or think about your neighborhood. Please answer the following questions about your neighborhood and yourself. Please answer as honestly and completely as possible and provide only one answer for each item. There are no right or wrong answers and your information is kept confidential.

61. Types of residences in your neighborhood: Among the residences in your neighborhood…

	None	A Few	Some	Most	All
How common are detached single-family residences in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are townhouses or row houses of 1-3 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos 1-3 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos 4-6 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos 7-17 stories in your immediate neighborhood?	☐	☐	☐	☐	☐
How common are apartments or condos more than 13 stories in your immediate neighborhood?	☐	☐	☐	☐	☐

62. Stores, Facilities, and other things in your neighborhood: About how long would it take to get from your home to the nearest businesses or facilities listed below if you walked to them? *Please put only one check mark for each business of facility.*

	1-5 min	6-10 min	11-20 min	21-30 min	31+ min	Don't know
Example: gas station	☐	☐	✓	☐	☐	☐
Convenience/small grocery store	☐	☐	☐	☐	☐	☐
Supermarket	☐	☐	☐	☐	☐	☐
Hardware store	☐	☐	☐	☐	☐	☐
Fruit/vegetable market	☐	☐	☐	☐	☐	☐
Laundry/ dry cleaners	☐	☐	☐	☐	☐	☐
Clothing store	☐	☐	☐	☐	☐	☐
Post office	☐	☐	☐	☐	☐	☐
Library	☐	☐	☐	☐	☐	☐
Elementary school	☐	☐	☐	☐	☐	☐
Other schools	☐	☐	☐	☐	☐	☐
Book store	☐	☐	☐	☐	☐	☐

Fast food restaurant	☐	☐	☐	☐	☐	☐
Coffee place	☐	☐	☐	☐	☐	☐
Bank/credit union	☐	☐	☐	☐	☐	☐
Non-fast food restaurant	☐	☐	☐	☐	☐	☐
Video store	☐	☐	☐	☐	☐	☐
Pharmacy/drug store	☐	☐	☐	☐	☐	☐
Salon/barber shop	☐	☐	☐	☐	☐	☐
Your job or school	☐	☐	☐	☐	☐	☐
[check here _____ if do not have work away from home or do not attend school						
Bus or trolley stop	☐	☐	☐	☐	☐	☐
Park	☐	☐	☐	☐	☐	☐
Recreation center	☐	☐	☐	☐	☐	☐
Gym or fitness facility	☐	☐	☐	☐	☐	☐

63. Access to Services: Places for walking and cycling: Please check the box that best applies to you and your neighborhood. Both local and within walking distance mean within a 10-15 minute walk from your home.

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**
I can do most of my shopping at local stores	☐	☐	☐	☐
Stores are within easy walking distance of my home	☐	☐	☐	☐
Parking is difficult in local shopping areas	☐	☐	☐	☐
There are many places to go within easy walking distance of my home	☐	☐	☐	☐
It is easy to walk to a transit stop (bus, train) from my home	☐	☐	☐	☐
The streets in my neighborhood are hilly, making my neighborhood difficult to walk in	☐	☐	☐	☐
There are many canyons/hillsides in my neighborhood that limit the number of route for getting from place to place	☐	☐	☐	☐
	☐	☐	☐	☐

64. Streets in my neighborhood. Please check the answer that best applies to you and your neighborhood on neighborhood surroundings.

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**
The streets in my neighborhood do not have, or any, cul-de-sacs (dead-end streets)	☐	☐	☐	☐
There are walkways in my neighborhood that connect cul-de-sacs to streets, trails, or other cul-de-sacs	☐	☐	☐	☐
The distance between intersections in my neighborhood is usually short (100 yards or less; the length of a football field or less)	☐	☐	☐	☐
There are four-way intersections in my neighborhood	☐	☐	☐	☐

There are many alternative routes for getting from place to place in my neighborhood. (I don't have to go the same way every time).	☐	☐	☐	☐
The streets in my neighborhood are hilly, making my neighborhood difficult to walk in	☐	☐	☐	☐
There are many canyons/hillsides in my neighborhood that limit the number of route for getting from place to place	☐	☐	☐	☐
	☐	☐	☐	☐

65. Places for walking and cycling: please check the box that best applies to you and your neighborhood.

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**
There are sidewalks on most of the streets in my neighborhood	☐	☐	☐	☐
The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks)	☐	☐	☐	☐
There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to	☐	☐	☐	☐
Sidewalks are separated from the road traffic in my neighborhood by parked cars	☐	☐	☐	☐
There is a grass/dirt strip that separates the streets from the sidewalks in my neighborhood	☐	☐	☐	☐

66. Neighborhood surroundings: Please check the box that best applies to you and your neighborhood

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**
There are trees along the streets in my neighborhood	☐	☐	☐	☐
Trees gives shade for the sidewalks in my neighborhood	☐	☐	☐	☐
There are many interesting things to look at while walking in my neighborhood	☐	☐	☐	☐
My neighborhood is generally free from litter	☐	☐	☐	☐
There are many attractive natural sights in my neighborhood (such as landscaping, views)	☐	☐	☐	☐
There are attractive buildings/homes in my neighborhood	☐	☐	☐	☐

67. Safety from traffic: Please check the box that best applies to you and our neighborhood

	Strongly Disagree	**Somewhat Disagree**	**Somewhat Agree**	**Strongly Agree**

There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood	☐	☐	☐	☐
There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.	☐	☐	☐	☐
The speed of traffic on the street I live on is usually slow (30 mph or less)	☐	☐	☐	☐
The speed of traffic on most nearby streets is usually slow (30 mph or less)	☐	☐	☐	☐
Most drivers exceed the posted speed limits while driving in my neighborhood	☐	☐	☐	☐
There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood	☐	☐	☐	☐
The crosswalks in my neighborhood help walkers feel sage crossing busy streets	☐	☐	☐	☐
When walking in my neighborhood, there are a lot of exhaust fumes (such as from cars, buses).	☐	☐	☐	☐

68. Neighborhood satisfaction Below are things about your neighborhood with which you may or may not be satisfied. Using the scale below, indicate your satisfaction with each item by placing the appropriate check in the box. Please be open and honest in your responding.

	Strongly Dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Strongly Satisfied**
The highway access from your home?	☐	☐	☐	☐	☐
The access to public transportation in your neighborhood?	☐	☐	☐	☐	☐
Your commuting time to work/school?	☐	☐	☐	☐	☐
The access to shopping in your neighborhood?	☐	☐	☐	☐	☐
How many friends you have in your neighborhood?	☐	☐	☐	☐	☐
The number of people you know in your neighborhood?	☐	☐	☐	☐	☐
How easy and pleasant it is to walk in your neighborhood?	☐	☐	☐	☐	☐
How easy and pleasant it is to bicycle in your neighborhood?	☐	☐	☐	☐	☐
The quality of schools in your neighborhood?	☐	☐	☐	☐	☐
Your access to entertainment in your neighborhood (restaurants, movies, clubs, etc.)?	☐	☐	☐	☐	☐
The safety from threat of crime in your neighborhood?	☐	☐	☐	☐	☐
The amount and speed of traffic in your neighborhood	☐	☐	☐	☐	☐
The noise from traffic in your neighborhood?	☐	☐	☐	☐	☐

The number and quality of food stores in your neighborhood?	☐	☐	☐	☐	☐
The number and quality of restaurants in your neighborhood?	☐	☐	☐	☐	☐
Your neighborhood as a good place to raise children?	☐	☐	☐	☐	☐
Your neighborhood as a good place to live?	☐	☐	☐	☐	☐

QUESTIONS ABOUT YOUR NEIGHBORHOOD CRIME

We'd like to as you some questions about your local neighborhood. (Your 'local neighborhood' is the area within 15 minutes walk of your home).

69. Safety from Crime: Please check the box that best applies to you and your neighborhood on safety from crime.

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
My neighborhood streets are well lit at night	☐	☐	☐	☐
Walkers and bikers on the streets in my neighborhood can be easily seen by people in their homes	☐	☐	☐	☐
I see and speak to other people when I am walking in my neighborhood	☐	☐	☐	☐
There is a high crime rate in my neighborhood	☐	☐	☐	☐
The crime rate in my neighborhood makes it unsafe to go on walks during the day	☐	☐	☐	☐
The crime rate in my neighborhood makes it unsafe to go on walks at night.	☐	☐	☐	☐

70. Do you think there is a crime problem in your local neighborhood?
□ Yes □ No □ Don't Know

71. Please think about the amount of crime in your local neighborhood and whether or not this has changed over the past 12 months. Please select one only for each statement.

	Increased a lot	Increased a little	Stayed about the same	Reduced a little	Reduced a lot	Don't know	Haven't lived here for last 12 months
The amount of burglary in your local neighborhood has…	☐	☐	☐	☐	☐	☐	☐
The amount of violent crime (e.g. physical assaults) in your local neighborhoods has…	☐	☐	☐	☐	☐	☐	☐
The amount of crime committed by young people (e.g. aged under 17) in your local neighborhood has…	☐	☐	☐	☐	☐	☐	☐
The total amount of crime in your local neighborhood has…	☐	☐	☐	☐	☐	☐	☐

How many friends you have in your neighborhood?	☐	☐	☐	☐	☐	☐	☐
Would you say the level of police protection in your community has …	☐	☐	☐	☐	☐	☐	☐

72. In your view, what are the major causes of crime in your neighborhood today? Please select all that apply.

	EVERYDAY
Poverty	O
Poor education/poor schooling	O
Poor parentings	O
Drugs	O
Alcohol	O
Unemployment	O
Breakdown of family	O

73. Thinking about people currently serving prison sentences in your neighborhood…do you think that **most prisoners** are there for… (please select only one)
□ Violent and sex crimes (e.g. physical assaults, rapes) □ Property crimes (e.g. burglary, theft)
□ Drug-related crimes □ Don't Know

74. Do you feel there need to be more police patrols, about the same number of police patrols, or less patrols in your community?
□ More police patrols □ About the same number of police patrols □ less police patrols

75. Does your community have a neighborhood crime watch program?
□ Yes □ No □ Don't Know

76. Do you belong to a neighborhood crime watch?
□ Yes □ No □ We do not have a neighborhood crime watch

77. In the past three years, have you been a victim of crime in **your** neighborhood?
□ Yes □ No

78. Have you purchased a gun for protection from crime in your neighborhood?
□ Yes □ No

79. Do you own a dog from protection from crime in your neighborhood?
□ Yes □ No

80. How safe do you feel going out at night in your neighborhood?
□ Very Unsafe
□ Unsafe
□ Safe
□ Very Safe

81. Do you feel more crimes in your community are committed by juveniles, adults, or are they about the same?
□ Juveniles
□ Adults

□ About the same

82. What type of crime do you feel is more of a problem in your community: property crimes such as vandalism and theft, violent crimes such as assault and armed robbery, or are they about the same?
□ Property Crimes
□ Violent Crimes
□ About the same

83. Please rank the following crime-reducing measures based on how effective you feel each would be for your neighborhood with 1 being least effective and 5 being most effective at reducing crime.

	1	2	3	4	5
Increasing police patrols	☐	☐	☐	☐	☐
Legalizing drugs	☐	☐	☐	☐	☐
Stronger prosecution and sentencing	☐	☐	☐	☐	☐
Supervised activities for juveniles	☐	☐	☐	☐	☐
Enforced curfew for juveniles	☐	☐	☐	☐	☐

YOUR THOUGHTS ABOUT THE QUESTIONNAIRE

About how long did it take you to complete this questionnaire? _____ *minutes*

As you know, we will be contacting you next year to conduct a follow up questionnaire. If the questionnaire is about the same length as it is now, would you still be willing to complete it? □ Yes □ No

In case we are unable to reach you by phone, email or mail next year (for example, if you move from your current home), please provide the contact information for a close friend or relative who will know how to help us get in touch with you.

Name: _____

Street Address: _____

City, State and Zip code: _____

Phone: _____

Email Address: _____

Also, please provide any suggested names and email of individuals that you think may be interested in participating in the GENTS Study.

Name:	Email:
1.	
2.	
3.	

Now that you have completed this questionnaire, you will receive your $25 gift card.

Thank you! You are now done with the GENTS Study questionnaire!

UNIVERSITY OF MARYLAND
INSTITUTIONAL REVIEW BOARD

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DATE: April 22, 2020

TO: Jennifer Roberts
FROM: University of Maryland College Park (UMCP) IRB

PROJECT TITLE: [1573165-1] Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County Study
REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: April 22, 2020
EXPIRATION DATE: April 21, 2021
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7; Consent Waiver: 45CFR46.116(f)(2).

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Prior to submission to the IRB Office, this project received scientific review from the departmental IRB Liaison.

This submission has received Expedited Review based on the applicable federal regulations.

This project has been determined to be a MINIMAL RISK project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of April 21, 2021.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Unless a consent waiver or alteration has been approved, Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Please note that all research records must be retained for a minimum of seven years after the completion of the project.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

STROBE Statement Checklist

A Case-Comparison Study Protocol for Gauging Effects of Neighborhood Trends and Sickness: Examining the Perception of Transit-Induced Gentrification in Prince George's County

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1-2	
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2	
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-12	
Objectives	3	State specific objectives, including any prespecified hypotheses	4-12	
Methods				
Study design	4	Present key elements of study design early in the paper	12-18	
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	12-18	
Participants	6	(*a*) *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	12-18	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	12-18	
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	12-18	
Bias	9	Describe any efforts to address potential sources of bias	12-18	
Study size	10	Explain how the study size was arrived at	12-18	

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Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	12-18
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	12-18
		(*b*) Describe any methods used to examine subgroups and interactions	12-18
		(*c*) Explain how missing data were addressed	12-18
		(*d*) *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	n/a
		(*e*) Describe any sensitivity analyses	n/a
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	n/a
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	n/a
		(b) Indicate number of participants with missing data for each variable of interest	n/a
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	n/a
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	n/a
		Cross-sectional study—Report numbers of outcome events or summary measures	n/a
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a

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Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n/a
Discussion			
Key results	18	Summarise key results with reference to study objectives	20-21
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	3
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	20-21
Generalisability	21	Discuss the generalisability (external validity) of the study results	20-21
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	22

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.