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SPEED REDUCTION FEASIBILITY STUDY

PREPARED FOR:
METRO NASHVILLE PUBLIC WORKS



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NASHVILLE, TENNESSEE 37212

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NASHVILLE, TENNESSEE**

**PREPARED FOR:
METRO NASHVILLE PUBLIC WORKS**

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EXECUTIVE SUMMARY

In response to Substitute Bill BL2019-1492, this speed limit reduction feasibility study analyzes the reduction of vehicular speed limits (30 mph to 25 mph) on all locally classified streets. The goal for the speed limit reduction is to increase safety for all roadway users – motorized and non-motorized users alike. An implementation strategy for accomplishing this task is provided along with potential issues and concerns, as well as possible countermeasures.

The recommended implementation strategy is as follows:

- Speed limit reduction (30 mph to 25 mph) would apply to all locally classified streets with the Urban Services District; any exceptions to this would be presented to and decided by the Traffic & Parking Commission following its typical procedures.
- A reduction requires all existing 30 mph speed limit sign faces be replaced. Metro Public Works' speed limit sign inventory (with geocoded locations) will be updated, while also noting existing speed limit pavement marking locations, using Metro Public Work's photolog.
- Conservatively, the sign face replacement process would occur over the course of one (1) year with the project divided into four relatively equal phases. The phases may be generally categorized by council districts. The most central, urbanized districts will be implemented first, and then expanding outward from there. The opinion of probable cost is approximately \$750,000 to \$1,000,000.
- Countermeasures for addressing potential issues and concerns with the speed limit reduction are detailed in this report. They fall within three general categories – education, engineering, and enforcement. The education component will likely be the most effective before, during, and immediately following construction in supporting this broad scale change. Countermeasures should be periodically monitored and evaluated in order to refine the mix of strategies as to maximize resources and associated impacts on safety.
- A task force focused on improving roadway safety should be considered to identify a specific countermeasure strategy tailored to meet Nashville-Davidson County's dynamic needs. This task force could also provide important analyses of, and guidance on, the evolution of this strategy.

1. INTRODUCTION

Substitute Bill BL2019-1492 passed its second reading at the Metropolitan Council of Nashville's ("Council") February 19, 2019 meeting. This bill directs Metro Nashville Public Works ("MPW") to complete an analysis for the reduction of vehicular speed limits on local streets, per the Major and Collector Street Plan of Nashville and Davidson County recommended in the 2016 WalkNBike Strategic Plan, and to submit a feasibility report with implementation recommendations to Council within a 30-day period.

This report seeks to provide general background information on the greater conversation of speed limit reductions occurring in communities across the country, which is often carried out as part of a larger Vision Zero strategy. High-level summaries of both aspirational and peer cities who have carried out speed limit reductions are provided to build an understanding of the strategies associated with achieving safe streets for all users. Potential issues and concerns for a similar reduction effort in Nashville-Davidson County are highlighted, along with a list of potential countermeasures that could help to achieve better speed limit compliance. Finally, a high-level implementation strategy for rolling out an extensive speed limit reduction on locally classified streets is provided. Scheduling, phasing, and an opinion of probable cost are included.

2. STUDY BACKGROUND AND FOUNDATION

Throughout the country there is a paradigm shift currently occurring for one of the most prevalent assets a municipality invests in, its roadways. The transportation network underlies every aspect of a citizens' life, from their ability to access goods and services, to their quality-of-life, health, and safety. Historically, ease of mobility for vehicles has been the dominant focus and drive of roadway designs, as well as the structure of a community's transportation network; however, negative impacts on the safety and comfort of pedestrians, bicyclists, and other non-motorized users of roadways and neighborhood streets, has resulted in a fundamental shift in the approach to traffic safety.

Vision Zero, an international strategy for eliminating traffic deaths and severe injuries on roadways, seeks to increase the safety for all roadway users, equally, as opposed to an auto-driven approach. It also deems the preservation of human beings' lives as well as their quality-of-life as community priorities worthy of investments. The strategy employs a "safe systems" approach to transportation planning, design, and implementation. It assumes drivers will inevitably make mistakes, even when trying to avoid from doing so. Therefore, roadway designs should reflect this fact with appropriate safety features, such as lower speed limits (which increases driver reaction times, reduces vehicle-stopping distances, and can increase sight distance), to prevent serious and fatal crashes when these mistakes do occur. This approach differs from the traditional approach in the manner it identifies the problem, causes, responsible party, planning approach, and ultimate safety goal. The traditional method finds blame in the individual road users due to human error when an accident occurs, whereas the Vision Zero approach identifies faults in the system design and places a higher priority on fatalities and serious injuries than overall crash frequency. Speed management is a major tenant to Vision Zero's safe systems approach.

Jurisdictions around the world and even inter-jurisdictional departments have recognized, adopted, and implemented Vision Zero differently. Metro Public Works does not currently have staffing, programming, or funding specifically designated as Vision Zero. However, the intent and methods of Vision Zero are strived for in MPW's everyday safety focus, as well as special projects like roundabout construction, neighborhood traffic calming, and this speed limit reduction effort.

The Metropolitan Government of Nashville and Davidson County's ("Metro") 2017-2020 Transportation 3-Year Action Plan, *Moving the Music City*, is a guiding document for near-term action regarding increasing the safety of city streets, as well as increasing the options and viability of non-motorized travel. The Plan outlines dozens of near-term initiatives for achieving a variety of mobility goals, which are all underlined by the City's first priority, public safety. Vision Zero is one of the four overarching mobility goals. Nine actions/initiatives for improving safety on Nashville's streets are detailed, including creating safer neighborhoods. MPW is tasked with several actions in working towards this goal. This includes the implementation of Walking District pilots and "adding 'quick build' walkways to its

community-driven Traffic Calming Program”, which MPW has accomplished and continues to build upon. Additional efforts in working towards safer, more multimodal streets are highlighted on the following two pages.

HIGHLIGHT: EXAMPLES OF ADDITIONAL RECENT TRAFFIC CALMING EFFORTS IN NASHVILLE-DAVIDSON COUNTY IN SUPPORT OF CITY MOBILITY GOALS

Achieving slow, safe streets takes strategies from all angles. Discussed in the speeding countermeasure section, an approach that includes education, engineering, and enforcement is necessary for success. Examples of efforts with Nashville-Davidson County that have occurred relatively recently, include:

Metro Neighborhood Traffic Calming Program (MPW)

In addition to a walk/bike pathway reappropriated from excess pavement width in South Nashville, the Metro Neighborhood Traffic Calming Program has successfully implemented, or is currently in the neighborhood action process of constructing, more robust traffic calming measures, including four neighborhood traffic circles and series of speed cushions on two higher-volume neighborhood streets.



Last month, eight neighborhoods were selected for additional traffic calming analysis following the conclusion of the Program's first open application submittal period, which will occur twice a year (in January and July). For the 60+ requesting neighborhoods, the Program's new prioritization strategy was used to rank requests based on greatest need. Data points include crash history, vehicle speeds and volumes, availability of non-motorized infrastructure, and nearby destinations. Neighborhoods have already begun coordinating with MPW staff to set up design meetings with residents.

Implementation of WalkNBike Bikeway Network (MPW, Metro Planning Department)

In the past two years, planners and engineers have teamed up to provide a neighborhood-based design approach to the implementation of Nashville-Davidson County's envisioned bikeway network. Part of bike lanes' ability to increase roadway safety for all users has to do with slowing vehicle speeds; therefore, traffic calming elements are important aspects to the success of a bike facility. In 2017, 10th Avenue South was restriped to utilize excess pavement width in order to incorporate parking-protected bike lanes on a two-lane roadway. A "floating bus island" was constructed to improve safety for transit users, as well as help to physically narrow the originally wide roadway.

The bikeways teams (MPW and Metro Planning Department) have recently partnered with The Nations Neighborhood Association to identify locations for the construction of potential neighborhood traffic circles at key locations to enhance the envisioned neighborhood greenway facility that will provide a low-stress connection throughout the neighborhood.



Grassroots Advocacy, Tactical Urbanism, and Community Education (TURBO Nashville, Walk Bike Nashville)

Non-governmental agencies, non-profits, and other interest groups have been working at the grassroots level for many years to increase safety for all users on Nashville-Davidson County's streets. TURBO Nashville (an initiative of the Nashville Civic Design Center) and Walk Bike Nashville are two organizations that have been working on traffic calming through the lens of community education as well as tactical urbanism, where temporary and permanent traffic calming measures have been deployed in various neighborhoods to demonstrate and measure improvements to safety.



Originally emerging from a grassroots neighborhood initiative, Walking District pilots, which included the original neighborhood (Hillsboro-West End, also known as “HWEN”), were established in three neighborhoods in 2017. The additional two neighborhoods were selected based on a variety of elements, including the structure of the roadway network (grid-like pattern versus curvilinear, suburban-style subdivision streets), traffic patterns, demographics, development patterns, and availability of pedestrian accommodations. The goal was to test the success of speed limit reductions combined with minor signage and pavement marking improvements. Collector roadway speed limits were reduced from 30 or 35 mph to 25 mph, while locally classified streets were reduced from 30 mph to 20 mph. The study included pre- and post-data collection and observations to evaluate the impacts in driving behaviors. At a general high-level, results showed improvements in average speeds, although 85th percentile speeds (a metric often used for understanding speed limit compliance in traffic engineering) remained statistically unchanged. Essentially, the majority of drivers that typically drive in a prudent manner slowed their speeds; however, the behavior of the few that choose to drive recklessly and disobey laws did not change. A follow-up resident survey showed overall positive feedback, but there was a desire for additional engineering and enforcement countermeasures to further reduce vehicular speeds as well as other reckless driving behaviors (distracted driving, not yielding to pedestrians, rolling through stop signs, etc.). Ultimately, the study recommends a speed limit reduction on all locally classified neighborhood streets in Nashville-Davidson County, to 25 mph instead of 20 mph, among other action items. This is due, largely in part, to the suburban-style development patterns that dominate Nashville-Davidson County and the unlikelihood of achieving 20 mph operating speeds in a large portion of neighborhoods. Recent speed and volume data from the Walking Districts is highlighted on the following page.



An additional action outlined in the 3-Year Plan is for city agencies to “review Metro's speed limit policy for all municipal streets and for local residential streets”. BL2019-1492 addresses this action, in part; by requesting a feasibility analysis of the reduction in posted speed limits for all locally classified streets in Nashville-Davidson County, as well as an implementation strategy should the change be codified.

HIGHLIGHT: RECENT WALKING DISTRICT DATA COLLECTION

Shifting driving behaviors at a large scale, particularly as it relates to speeding, can take years before sizable benefits are experienced, especially when the American culture is so deeply engrained around the automobile. Speed and volume data was collected on sample local streets (posted at 20 mph) from each Walking District (“WD”) in mid-March 2019 to test speed limit reduction impacts. Follow-up data was originally collected 1-2 months following implementation of the new Walking District measures, which are also provided in the table below.

CHANGES IN WEIGHTED AVERAGE SPEEDS (BOTH DIRECTIONS)						
	“BEFORE” WD (2016/2017)	“AFTER” WD (2017/2018)	DIFFERENCE (2016/2017 to 2017/ 2018)	2019	DIFFERENCE (2017/2018 to 2019)	OVERALL DIFFERENCE (2016/2017 to 2019)
Cleveland Park						
N. 2 nd St.	26.7 mph	23.4 mph	-3.3 mph	26.2 mph	+2.8 mph	-0.5 mph
N. 6 th St.	24.7 mph	25.0 mph	+0.3 mph	26.4 mph	+1.4 mph	+1.7 mph
Hillsboro-West End						
W. Linden Ave.	24.9 mph	24.6 mph	-0.3 mph	23.7 mph	-0.9 mph	-1.2 mph
Bernard Ave.	26.0 mph	27.2 mph	+1.2 mph	25.4 mph	-1.8 mph	-0.6 mph
Una Antioch						
Piccadilly Row	31.2 mph	30.1 mph	-1.1 mph	31.0 mph	+0.9 mph	-0.2 mph

Results on these randomly selected Walking District streets show initial increases and reductions in the weighted average speeds directly following implementation. Roughly a year to two following the Pilot Program, speed and volume results (when comparing weighted averages between 2019 and “after” conditions) showed continued improvement on the streets within HWEN. The other three streets showed an upwards tick in averages; however, overall reductions were still maintained between 2019 and “before” conditions, except for N. 6th Street in Cleveland Park. Continued monitoring of impacts, positive and negative, should be considered, especially in terms of crash experience. Isolating contributing/detracting environmental factors can help Nashville-Davidson County tailor their strategies towards increasing compliance in a variety of neighborhood settings.

3. ASPIRATION AND PEER CITY EXPERIENCES WITH SPEED LIMIT REDUCTIONS

3.1 Aspirational City Methodologies and Experiences

Cities are hotbeds for innovative approaches to urban living, including roadway designs that better accommodate all modes of travel while increasing the overall comfort of public spaces. This section includes information on aspirational cities (New York City, New York and Portland, Oregon) and their multi-pronged approaches to increasing roadway safety. The information is intended to generate ideas for potential similar approaches in Nashville-Davidson County, as well as to establish an understanding that a comprehensive approach is necessary to success.

New York City, New York

New York City was the first American city to adopt the Vision Zero program in 2014 with the goal of providing safer streets for all road users through education, law enforcement, public dialogue, street design, and legislation. When analyzing fatal traffic crashes, speeding is often classified as a leading cause. Thus, the City has implemented a multitude of diverse efforts focused on encouraging drivers to reduce their vehicular speeds, including a reduction in default speed limit to 25 mph in November of 2014¹. Some key additional efforts are as follows:

EDUCATION

- From 2014 through 2018, 1,484 schools and 356 senior centers were visited by the City's Vision Zero team to provide safety education for residents of designated priority locations².
- "Street teams" of City staff target all roadway users in areas with informational flyers and general discussions with people regarding roadway safety. Police provide on-foot patrol during the typical weeklong duration of the educational outreach. The week is followed up with a period of targeted enforcement of the most common moving violations, which lead to modal conflicts.
- The Taxi and Limousine Commission (TLC) uses outreach and education to promote safety among the many for-hire drivers by incorporating Vision Zero content into the permitting process and taxi school curriculum³.

ENGINEERING

- In 2017, 390 speed humps were installed, doubling the installation pace from years prior to Vision Zero⁴.
- From 2014 through 2018, 461 Safety Engineering Projects were completed. These include a myriad of design strategies aimed at

¹ "Automated Speed Enforcement Program Report, 2014-2017." *NYC DOT*. 2017.

² "Borough Pedestrian Safety Action Plans – Vision Zero Update." *NYC DOT*. Feb., 2019.

³ "TLC Vision Zero Outreach." *NYC Taxi & Limousine Commission*. 2019.

⁴ "Automated Speed Enforcement Program Report, 2014-2017." *NYC DOT*. 2017.

discouraging speeding, such as narrowing travel lanes that had excess pavement width, road diets, median installations, and the reassignment of traffic lanes to accommodate pedestrian, bicycle, or parking facilities⁵.

ENFORCEMENT

- Speeding summonses issued by the New York Police Department (NYPD) increased significantly (over 93%) from years preceding Vision Zero to 2017⁶.
- Speed cameras were installed near 140 school areas to penalize drivers whose speeds exceed the posted school-zone speed limit by more than 10 mph during school hours with a \$50 Notice of Liability⁷.
 - From 2014 through 2018, over 5 million automated speed camera violations were issued citywide. Although there are several legislative restrictions for when and where speed cameras can be used, school speed zones with speed cameras saw a 17% decline in the number of severe injuries in crashes after the activation of the cameras.
 - State Law allows the City use speed cameras strictly for enforcement on streets abutting a school property within 1,320 feet of the school during the school hours and extracurricular school activities. Enforcement via speed cameras is also permitted within an hour prior to and after school hours and 30 minutes prior to and after extracurricular activities. NY State Law prohibits the use of speed cameras outside of the precise aforementioned guidelines. The City would like to see changes in legislation so that speed cameras can be used outside of school hours and be deployed in high-crash areas that do not necessarily abut a school.

Portland, Oregon

The City of Portland adopted the Vision Zero program in 2015, after which a High Crash Network (HCN) consisting of 30 high crash streets and 30 high crash intersections was identified. Although the HCN encompasses only 8% of Portland's streets, 57% of the City's fatal crashes occur within this designated network⁸.

Through its Vision Zero initiatives, City staff analyzed several data sets related to traffic crashes and concluded that most fatalities occur on streets with higher

⁵ "Borough Pedestrian Safety Action Plans – Vision Zero Update." NYC DOT. Feb., 2019.

⁶ "Automated Speed Enforcement Program Report, 2014-2017." NYC DOT. 2017.

⁷ Ibid.

⁸ "Taming Speed for Safety – A Defining Approach and Leadership from Portland, Oregon." *Vision Zero Network*. 2018.

speed limits (35-45 mph). This finding encouraged the Portland Bureau of Transportation (PBOT) to prioritize speed reduction efforts through the following Vision Zero Action Plan strategies:

RESEARCH⁹

- To determine appropriate speed limits on non-arterial roads, which account for 94% of Portland’s streets network, the City of Portland developed a unique strategy that varies greatly from the widely utilized 85th percentile methodology. In 2016, the Oregon Department of Transportation (ODOT) granted Portland the ability to use a speed-setting methodology that consists of a Simplified Decision Matrix. Through this matrix, City Staff can determine which roadway design features are necessary to ensure the safety of different road users when vehicles are traveling at varying speeds. The concept of setting speed limits based on a roadway’s 85th percentile speed was developed based on studies from the 1960s conducted on rural roads, which differ significantly from urban roads that accommodate a diverse mix of road users. Thus, the 85th percentile speed-setting practice does not take into consideration key safety concerns that seem irrelevant for rural roads but are important to account for in an urban setting. With this, PBOT hopes its Simplified Decision Matrix can help the City set safer speed limits citywide. PBOT’s Simplified Decision Matrix is presented below in Figure 1.

Street and Limits:		Street								
Advisory		Statutory								
		10 MPH	≤15 MPH	≤25 MPH	≤25 MPH	530 MPH	≤35 MPH	≤40 MPH	≤45 MPH	≤50 MPH
PED	Shared Roadway			5' Sidewalk 100% Open Sidewalk	5' Separation Both Sides Curb or Swale; 8' Separation	>8' Separation Both Sides NCHRP 662 Crossings: 20'Hr.	>12' Separation Both Sides	Impermeable Separation Barrier		
	Shared Roadway			≤ 5' Bike Lane	5' - 7' Bike Lane	Minimum 2' Separation from Autos	Permeable Barrier	Impermeable Separation Barrier		
AUTO	Gravel Roadway			10' Travel Lanes, Greenway	10' Travel Lanes	≤ 11' Travel Lanes Angle Crash Mitigations	Permeable Center Barrier; Roadside Object Setback or Shielding	Impermeable Center Barrier		
	Shared Roadway			≤ 5' Travel Lanes	10' Travel Lanes	≤ 11' Travel Lanes Angle Crash Mitigations	Permeable Center Barrier; Roadside Object Setback or Shielding	Impermeable Center Barrier		
Notes:		None								

Figure 1: PBOT’s Simplified Decision Matrix

⁹ Ibid.

In order to receive approval to reduce a street's posted speed limit, PBOT presents a speed zone investigation to Oregon Department of Transportation (ODOT) with an analysis of the following factors:

- Adjacent land uses; street widths; average daily traffic volume; total number of fatal and injury crashes in a certain time period; number of crashes per mile in a certain time period; detailed description of available pedestrian, bicycle, and vehicle facilities.

From this investigation, a recommendation for a 20 mph posted speed limit can be made to reduce the risk of fatality for a pedestrian or bicyclist hit by a vehicle to 10%, versus a fatality risk of 40% found for vehicles driving at 30 mph.

EDUCATION¹⁰

- A communication campaign for public outreach was established in Spring 2018.
- A messaging campaign was initiated to support safe speeds and build public awareness of Vision Zero.
- Education on traffic safety cameras was distributed to nearby residents and businesses prior to launching this safety initiative.

ENGINEERING

- The City of Portland decreased posted speed limits to 20 mph on residential local roadways in April 2018¹¹.
- Signage was installed based on a priority system to promote connectivity between two, or more, higher classification streets. Priority was also given to locations neighboring bus stops, school, and parks.
- Enhancements to street design, such as traditional bike lanes, protected bike lanes, and raised curbs, were considered. Under its strategy of enhancing street design in order to discourage speeding, PBOT has developed a prioritization process that allows for efforts to focus on Portland's High Crash Network, with special attention paid to communities identified based on a list of 10 equity indicators. The indicators are as follows¹²:
 - Low-income households; people with disabilities; low English proficiency persons; youth; older adults; affordable housing; lower paying jobs; poor vehicle access; access to services.

¹⁰ "20 mph Residential Speed Limits." *PBOT's City Council Presentation*. 2018.

¹¹ "Residential Speed Limit Reduction." *PBOT*. 2019.

¹² "Taming Speed for Safety – A Defining Approach and Leadership from Portland, Oregon." *Vision Zero Network*. 2018.

- In order to prioritize the allocation of project funding, the City identifies intersections within its HCN considered highly unsafe and cross-references the identified intersections with communities in need, as determined through the equity indicators aforementioned¹³.
- Future plans include evaluating the impact of the reduced 20 mph speed limit on public safety.

ENFORCEMENT

- Safety cameras were installed on streets with high injury rates. After an initial evaluation in 2017 prior to the reduction in posted speed, at three study intersections speeding was reduced 47 percent, 68 percent, and 61 percent after installation of speed safety cameras¹⁴.

3.2 Peer City Methodologies and Experiences

The cities of Charlotte, North Carolina, Wheaton, Illinois, Decatur, Georgia, and Lexington, Kentucky were selected as somewhat similar (peer) cities to Nashville, Tennessee that have implemented a large-scale speed reduction strategy. Cities were selected based on general similarities in their transportation networks and/or commuting characteristics with that of Nashville-Davidson County. The goal was to include networks that reflect the spectrum of roadway contexts and neighborhood structures in Nashville. Availability of information and data (regarding speed reductions) on municipal websites was a limiting factor in peer city selection. Therefore, size and demographics vary among these communities as compared to Nashville.

- Charlotte, NC – Medium-Sized City – Population: 859,035 (2017) – Network Characteristics: historic center with grid-like street pattern, suburban-style commuting corridors with subdivision cul-de-sacs further out from downtown core
- Wheaton, IL – Suburb of Chicago – Population: 53,373 (2017) – Network Characteristics: small historic center with grid-like street pattern, largely suburban-style commuting corridors with subdivision cul-de-sacs, access to commuter rail
- Decatur, Georgia – Suburb of Atlanta – Population: 23,832 (2017) – Network Characteristics: commercial center, largely suburban-style commuting corridors with subdivision cul-de-sacs, access to commuter rail
- Lexington, Kentucky – Small-Sized City – Population: 321,959 (2017) – Network Characteristics: historic center with grid-like street pattern, suburban-style commuting corridors with subdivision cul-de-sacs further out from downtown core

¹³ Ibid.

¹⁴ Ibid.

Relevant information is provided below to gain insight on similar speed reduction efforts and traffic calming practices throughout the country.

Charlotte, North Carolina

Following the global Vision Zero initiative, Charlotte strives to eliminate all pedestrian deaths on its city streets by 2030. A myriad of actions are required to achieve this goal considering that 27 pedestrian fatalities were reported in 2017¹⁵. Approximately 80% of these pedestrian deaths occurred on arterial roads with two or four lanes of travel and speed limits of 35 mph or 45 mph¹⁶.

As one of its Vision Zero efforts, Charlotte's City Council approved a set of measures aimed at facilitating the process that neighborhoods must follow to apply for traffic calming measures and to request that the posted speed limits on neighborhood streets be reduced to 25 mph in November 2018. The set of approved measures includes the following changes¹⁷:

EDUCATION

- Assistance is provided to “distressed neighborhoods” (i.e., low income) so that signatures required for traffic-calming petitions can be successfully collected.

ENGINEERING

- The installation of a speed hump can be requested for streets with a minimum of 600 vehicles per day.
- The installation of a stop sign can be requested based on traffic counts from both the major and the minor streets adding up to a minimum of 600 vehicles per day, as opposed to solely counting major street traffic.
- The installation of both a speed hump and a stop sign can be requested with a minimum of 1,500 vehicles per day.
- Upon the request of individual neighborhoods, the current citywide speed limit of 35 mph, unless otherwise posted, can be lowered to 25 mph.

Wheaton, Illinois

As part of its efforts to enhance public safety, the Wheaton City Council approved the reduction of the speed limit on residential streets from 30 mph to 25 mph in July 2018. A speed limit of 30 mph was maintained on residential streets considered major collectors through which more than 6,000 vehicles travel per

¹⁵ “A record 27 pedestrians died in Charlotte last year. This year could be worse.” *Charlotte Observer*. 16 Nov., 2018.

¹⁶ *Ibid.*

¹⁷ “Charlotte Neighborhood Traffic Calming Program: Policy Updates.” *Charlotte, NC TAP Committee Presentation*. 24 Sept., 2018.

day¹⁸. The following initiatives were conducted in association with the speed reduction:

RESEARCH

- The decision to maintain the 30-mph speed limit on some roadways was made following completion of a traffic study on collector roads¹⁹. For the study, traffic data was collected along Wheaton's collector street system to determine whether the procedure used to classify the city's roadways should be modified and if reducing the speed limit on collector streets would be appropriate from a traffic engineering perspective. The study concluded that instead of having three roadway classifications – local roads, collectors, and arterials – the city should have five classifications to differentiate minor collectors and arterials from major collectors and arterials. This recommendation stemmed from the high range of traffic volumes recorded on the city's collectors, which varied from 1,000 to over 10,000 vehicles per day. In terms of speed data collection, the study concluded that the 85th percentile speed on several streets surpassed the posted speed limit by more than five mph. Most of the streets where high 85th percentile speeds were recorded are characterized by physical conditions that tend to encourage drivers to drive faster. Such conditions include long stretches of uninterrupted flow, wide travel lanes, limited access, and no/limited on-street parking.

EDUCATION

- In order to increase awareness about the speed limit change, residents were welcome to obtain "Drive 25" yard signs and car magnets at city hall.
- A strong communication campaign was implemented, accompanied by a grace period in which officers only issued warnings.

ENGINEERING

- Portable Dynamic Message Signs (DMS) and street signs were installed to raise awareness.
- Speed limit change as a result of a citywide plan to improve public safety that included several sidewalk-widening projects.

ENFORCEMENT

- Law enforcement began enforcement of the speed limit upon erection of the new speed limit signs. As a suburb of Chicago with a population of approximately 52,000 people (~11.5 square miles), the implementation of new speed limit signs in Wheaton was carried

¹⁸ "New Residential Speed Limit." *City of Wheaton, Illinois-Transportation & Parking Department*. 2018.

¹⁹ "Collector Roads Traffic Study & Residential Street Speed Limit." *City of Wheaton, Illinois*. 2018.

out during the few weeks following Council's approval of the speed limit reduction in July of 2018. The reduced speed limit took effect on August 1, 2018²⁰.

Decatur, Georgia

In April of 2018, the Decatur City Commission approved the request to create Residential District Speed Zones (RDSZ) to facilitate the issue of speeding tickets in certain areas. This included the following enforcement initiatives²¹:

ENFORCEMENT

- Although no changes were made to the posted speed limits across the city, police officers were granted permission to write a speeding ticket to any driver traveling at 1 mph above the posted speed limit on any of the 16 areas designated RDSZ.
 - Prior to this change, officers were only allowed to ticket drivers traveling at more than 11 mph above the posted speed limit.
 - The streets encompassed by the established RDSZ are traffic generator roadways known for connecting to high-volume street and being in close proximity to schools. Thus, the RDSZ streets carry high traffic volumes during peak hours.

Lexington, Kentucky

In February of 2016, the Urban County Council unanimously decided to reduce the posted speed limit on 21 downtown streets from 35 mph to 25 mph based on high crash rates (72% occurring downtown) and an increase in pedestrian crashes²². The goal of the legislation was to encourage more multi-modal trips in the downtown area. Following this legislation, University of Kentucky agreed to lower posted speeds on their local roadways as well. Speed limits on state roadways, however, were not altered. The following measures were taken to implement the reduction in speed:

EDUCATION

- Public service announcements were made to emphasize the threat of higher speeds to pedestrian safety. These announcements were aired on local television to encourage speeds of under 25 mph in the downtown area and residential neighborhoods.

²⁰ "Speed Limit Lowered for Wheaton Neighborhoods". City of Wheaton, Illinois-Traffic & Parking Department. 2018.

²¹ "Decatur adding 16 streets to 'Residential District Speed Zones'." *Atlanta. News. Now.* 9 Apr., 2018.

²² "Speed limit will drop from 35 mph to 35 mph on some downtown Lexington streets in spring." *Lexington Herald Leader.* 4 Feb., 2016.

- A social media campaign was implemented with funding by donations made to Kentucky's "Share the Road" campaign established by the Kentucky Bicycle and Bikeway Commission.

ENGINEERING

- To decrease speeds, 158 speed limit signs were installed at a cost of \$5,900²³.

ENFORCEMENT

- The local police department assisted with raising driver awareness by issuing warning citations in the downtown area during the early stages of implementation.

²³ "Speed limits on dozens of downtown Lexington streets could lower from 35 to 25 mph."
Lexington Herald Leader. 17 Nov., 2015.

4. SPEED LIMIT REDUCTION FEASIBILITY FOR NASHVILLE-DAVIDSON COUNTY

4.1 Proposed Scope of Speed Limit Reduction

Roadways are classified based on the function they provide within the overall network, meaning how they serve the flow of trips within that network, as well as the type and number of accesses it provides to individual adjacent properties. The traditional functional classification hierarchy breaks the roadway network down into three categories based on the level of mobility and accessibility the roadway provides:

There is often a relationship between posted speed limits and roadway functional classifications. Typically, arterials have higher posted speeds, while locals have lower speeds. The lower speeds provide safety benefits for both motorized and non-motorized users.

- Arterials (high level of mobility, typically lower level of access)
- Collectors (balance of mobility and accessibility)
- Locals (low level of mobility, high level of access)

Comprehensive transportation planning uses functional classification to determine the most logical and efficient manner for funneling traffic within the roadway network. For roadway designers, functional classification dictates a roadway's design, particularly its design speed. Community planners work to tie community transportation (mobility, accessibility) and land use/development (livability) goals together during key stages in the developmental process, largely by 'right-sizing' roadway designs according to their existing and future land context, not just their function within the roadway network.

The scope of the potential speed limit reduction for Nashville-Davidson County includes locally classified streets per the Major and Collector Street Plan (MCSP) of Nashville and Davidson County recommended in the 2016 WalkNBike Strategic Plan. The MCSP maps "the vision for Nashville's major and collector streets and ensuring that this vision is fully integrated with the city's land use, mass transit, and bicycle and pedestrian planning efforts". The Plan's guidance for the planning, construction and redevelopment of these roadways expands upon the traditional functional classification system by incorporating considerations for existing and future adjacent land use character (i.e., context) into design elements. The three street context types used in the MCSP include residential, mixed use, and industrial, while the roadway functional design types, include:

- Arterial-Parkway
- Arterial-Boulevard
- Collector-Avenue

Although design guidance is not explicitly tailored in the MCSP for the following roadway types, it does acknowledge the importance of these roadways and how

design principles contained within the MCSP can be relevant for the efficiency, safety, and comfort of these facilities:

- Locals
- Access-Controlled Facilities, such as Interstates and Expressways

Local streets, the lowest order of the functional classification hierarchy, make up the majority of roadway miles in Nashville-Davidson County, and provide a variety of roles in varying contexts across the city. These contexts, such as residential, mixed-use, and industrial, are generally aligned with the street contexts outlined in the MCSP. Although local streets are typically two lanes, widths of local streets vary widely. Within urban contexts, widths are typically narrower, while in suburban areas, particularly within subdivisions, streets can be very wide. The fundamental function of a local street is to provide direct access to individual properties. Many of Nashville's local streets also operate as residential neighborhood streets meaning they provide important public spaces to pedestrians and playing children. Reckless driver behaviors (including speeding, whether perceived or real) negatively impact the safety and comfort of residents and other users of these streets, and ultimately, the livability of Nashville. Given the Nashville area's continued urbanization, and subsequent vehicular traffic pressure on these public spaces and the users traveling them, special attention has turned to one of our community's largest assets – local streets.

Locally classified streets within Nashville-Davidson County's Urban Services District (USD) are recommended to be the initial focus for the potential speed limit reduction. The USD encompasses what was once the City of Nashville's historic municipal limits prior to city-county government consolidation in 1963, and now includes areas such as Antioch and Donelson to the southeast and east of Nashville's core. USD boundaries were chosen for the speed limit reduction strategy based on higher density levels (population and built environment), historic street patterns and designs, as well as the greater expectation for pedestrians and bicyclists (i.e., increased chances for conflicts between non-motorized and motorized users). Higher density levels translate to higher traffic volumes in many locations. Historic street patterns and designs means more grid-like streets, narrower roadways, greater utilization of on-street parking, and higher levels of curbside activities, all of which contribute to "self-enforcement" of low operating speeds. Narrower environments create less opportunity for drivers to avoid collisions, and when combined with increased uncertainty along a roadway's curbside, such as on-street parallel-parked vehicle doors opening or a pedestrian stepping out into the roadway, most drivers tend to slow their speeds. Germantown, one of Nashville's densest neighborhoods, is a great example when thinking about this concept, especially the corridors of 4th Avenue North, 5th Avenue North (although a collector), and 6th Avenue North.

The General Services District (GSD) is not recommended for a district-wide speed limit reduction on local streets given the spectrum of contexts these streets serve in more rural, undeveloped areas of Nashville-Davidson County. Many local

roadways within the GSD (beyond subdivision developments) are narrow, winding country roads. In these locations, the ability to support a reduced speed limit with enforcement or engineering countermeasures is reduced. Reduction of speeds on streets within the GSD could become a second phase of implementation, after evaluation of the USD process.

Streets on which a 25 mph may not be suitable would be handled on a case-by-case basis through presentation to the Traffic & Parking Commission. This is the process currently used for the changing of any speed limit.

It should be noted that a speed reduction would not resolve all traffic concerns on locally classified roads, such as the need for traffic calming. The existing Traffic Calming Program plays an important role in supporting the speed reduction, especially on local streets experiencing higher volumes of speeding traffic. Furthermore, while this study does not evaluate roads classified as collectors, some collectors share similar characteristics, such as design and context, with local roads. In these locations, a speed limit reduction should be evaluated. The goal in these evaluations is to find an appropriate balance between the mobility, safety, and livability of the street.

4.2 Potential Issues & Concerns

Potential issues or concerns associated with a broad-sweeping speed limit reduction are outlined in this section. For elected officials and municipal departments, cost and logistical details are a concern when talking about the replacement of more than 2,800 sign faces; however, the success of this project relies on more than just the logistics of a smooth installation. Without some degree of education, engineering, and enforcement, the concerns listed in this section may endure. Measures to prevent and counteract these follow. A proposed implementation strategy along with an engineer's opinion of probable cost is included later in this study. Potential issues and concerns during and after implementation are as follows:

- Driver awareness of newly-reduced speed limits. This includes residents that live on the street or in the area, Nashville-Davidson County residents that do not live within the USD (whose neighborhood streets did not have a speed limit reduction), and commuters from adjacent municipalities and counties.
- Driver confusion when in an area with newly-reduced speed limits but on a street with no posted speed limit sign.
- Perception of reduced mobility for residents (i.e., ability to move through neighborhood quickly).
- People may not adhere to newly-reduced speed limit signs, especially on roadways in suburban areas where street widths are very wide and on-street parking is limited. Nashville also has a number of hilly

neighborhoods, which creates an additional hurdle for compliance, even for the most well intentioned drivers.

- Some residents will expect immediate adherence to and enforcement of new speed limits. A sweeping change could put a strain on the enforcement body's resources as a large percentage of road miles in the USD are local residential streets.
- Resident's perception of speeding in neighborhoods may not change. Traffic Calming will likely become more important to these residents.

Countermeasure Toolbox

Potential measures to counter the issues and concerns discussed above are highlighted in this section. They are arranged by the traditional traffic engineering approach to roadway safety – the three 'E's', Education, Engineering, and Enforcement. Measures from each category should be implemented in tandem with each other, as each plays its own unique role in achieving slow speed streets, changing cultural norms surrounding mobility and livability, and providing safe roadways for all users. Cities that have experienced measurable improvements in their roadway safety have all employed multi-pronged approaches. When speaking of successes, these cities emphasize the importance of approaching roadway safety from all angles.

EDUCATION

The education component should not be overlooked nor undervalued in the process of achieving safe streets. Engineering and enforcement countermeasures are costly to a community, and are not practical for every mile of each local street within Nashville. Education plays a critical role in shifting the American cultural paradigm around travel – from an auto-oriented one to one that considers all users of the roadway as equally-valuable and important. Those with potential application specific to this effort during/following implementation are provided below:

- *“Off-Site” Awareness/Education*
 - Media Blitz – using traditional and non-traditional methods to convey the message of changes prior to, during, and after implementation. These may include:
 - Approach local TV news channels and newspapers for message dissemination.
 - Make strategic social media posts using venues such as NextDoor, Twitter, Facebook, Instagram, etc.
 - Include message in monthly councilmember newsletters for several months following implementation.
 - Incorporate announcement in monthly council district and other neighborhood meetings held by councilmembers.
 - Utilize neighborhood associations, especially those that have been previously involved with the Traffic Calming Program, to

- disseminate the message and even tailor neighborhood-specific messaging strategies for maximum effectiveness.
- Deliver message using high visibility locations/venues. This could be accomplished through methods such as flyers/handouts/notices, yard signs, or small mobile exhibits that could be moved to a variety of community venues and events as the speed limit reduction progresses across the city. Examples include notices placed within utility bills, flyers placed at Vehicle Registration Offices, or yard signs placed at Vehicle Emissions Testing Locations or in school receiving/pick-up lines.
 - Place a detailed map of newly posted 25 mph streets on the MPW website for public dissemination.
 - Tailor message delivery for those that drive the streets of Nashville as their profession. These could include Metro Nashville School bus drivers, MTA Bus Drivers, Campus Transportation Drivers (such as Vanderbilt University), MPW fleet drivers, the Post Office, for-hire companies, rideshares, and delivery companies (such as FedEx, Amazon, and Uber Eats). While more resource-intensive, consider alerting the larger construction companies that are redeveloping Nashville's neighborhood streets. Some neighborhoods have expressed concern over construction-related driver behaviors through the Traffic Calming Program.
 - Establish a 'Pace Car' Pledge for residents to sign stating they will obey the newly posted speeds, even if vehicles stack up behind them, effectively creating a "mobile speed bump" for trailing traffic. Similar pledges in other cities also include language on the driver committing to being more aware of and courteous to non-motorized users. This type of grassroots strategy helps to target speeding from the ground up as opposed from the top down, creating greater momentum for a cultural shift in how our neighborhoods and living spaces are viewed and treated by vehicular drivers in Nashville.
 - Perform surveys to gauge public perception of the Traffic Calming Program and enforcement. Determine public awareness of the reduced posted speed and develop education programs that target specific audiences deemed less aware of these changes. Validate the effectiveness of public outreach campaigns by surveying public awareness of specific marketing strategies.
 - Update Google Map/Waze data with newly-posted speed limits, if possible.
- *"On-Site" Awareness/Education*
 - Place portable DMS at higher-volume entrances to neighborhoods in more suburban areas or generally place along key collector/arterial roadways in urban areas where traffic has numerous opportunities to travel into and through a neighborhood.

- Provide the opportunity for yard signs to be purchased or borrowed for residents interested in reinforcing the new speeds.

ENGINEERING

Engineering countermeasures implemented on streets can facilitate reduced speeds by physically and visually narrowing roadways, as well as providing horizontal or vertical deflection that physically alters driver behaviors (such as speed cushions or striping patterns (i.e., chicanes)). Countermeasures can also include incorporating space for safer bicycle and pedestrian movements. 'Right-sizing' existing streets aids in the ability of a roadway to self-enforce a lower speed limit. While engineering countermeasures and additional roadway design retrofits are outside the scope of this study, these measures are an important component in achieving slow speeds and safety goals. The Traffic Calming Program should continue to be funded in order to complete the detailed analyses and identification of appropriate engineering countermeasures at a more granular level.

In the design and approval process of new neighborhood developments, design speeds and other design elements should be evaluated for consistency and should consider countermeasures to facilitate low speeds.

ENFORCEMENT

Enforcement of newly posted speeds plays a part in the success of a sweeping speed limit reduction; however, it should not be considered as a panacea to stop speeding, nor is there a desire for it to be. With thoughtful preparation and implementation, this program can succeed without a significant enhancement in enforcement from Metro Nashville Police Department (MNPd). MPW and the MNPd should coordinate engineering and enforcement efforts through the Traffic Calming Program regarding roadways that have limited engineering countermeasure options or vice versa, limited options for safe, effective enforcement. Overlap in strategies can help target the most effective combination of countermeasures or design standard revisions for these especially troublesome streets.

By identifying the boundary of the speed limit change as the USD, MNPd officers will have a clear understanding of the speed limit, allowing for consistent enforcement. The intent of the proposed strategy is to limit driver and officer confusion both during and after the construction period.

Potential strategies to assist law enforcement include:

- An initial warning period (~1 month), similar to the approach used for the Walking Districts, could be implemented as residents become acclimated to driving at a reduced speed.

- Data regarding vehicle speeds and volumes is critical for making informed investment decisions. Data sharing coordination between MPW (Traffic Calming, Bikeways, and Traffic Engineering), MNPd, and the Metro Planning Department regarding recently collected data sets (speed and volume) could be beneficial for maximizing our existing resources efforts.
- Some communities have employed 'Neighborhood Speed Watch' programs in an effort to provide self-enforcement within their community (as well as an important education opportunity). These programs provide local residents with speed-reader boards or radar units from their local law enforcement agency or transportation department. Participants monitor passing vehicle speeds and report the speed, date, time, and license plate of each speeding incident. With this data, local law enforcement may send warning letters to offenders, or they may deploy their own enforcement team to address high-frequency speeding locations.

Evaluating the success of education, engineering, and enforcement efforts is a critical component in achieving safe streets and other community mobility goals. Collecting, analyzing, and sharing data allows for strategies and actions to be continually reevaluated and refined. This allows limited resources to be allocated to where the greatest need is and where efforts will have the most significant impact on improving safety. Successful cities across the country underscore the importance of data collection, the quality of data (ensuring that collected data points adequately inform desired safety goals, such as what/how information is included in crash reports), and finally, the continual evaluation of that data to properly refine education, engineering, and enforcement strategies.

5. SPEED LIMIT REDUCTION IMPLEMENTATION

5.1 Implementation Plan

INVENTORY

Implementation of any citywide speed limit reduction should be thoughtfully planned and implemented. The foundation of this process is a current and accurate, geocoded sign inventory. A speed limit sign inventory was completed by MPW several years ago; however, an update will be required prior to any implementation. The updated inventory should include all speed limit sign and marking locations within the USD.

PLANS AND PROCESS

Following the inventory update, a basic plans package should be prepared for contractors. The plans package should include details for each replacement scenario, quantities, and plan sheets indicating geo-located signage and pavement marking replacement locations. The plan set should be acceptable for bidding.

The design plans should reflect implementation on all locally classified streets within the USD. Implementation is recommended to include the replacement of all existing 30 MPH speed limit sign faces within the USD. Replacement signs should read 25 MPH. All existing 20 MPH or 25 MPH speed limit signs should remain.

Furthermore, all damaged sign posts should be replaced, and relocation should be considered, as identified in the signage inventory. Moreover, existing 30 mph speed limit pavement markings should be removed and replaced. In limited instances, additional speed limit pavement markings may be recommended.

Locations requiring post replacement or relocation should be identified separately. An additional 72 hours will be required for TN One Call in these locations.

Additional Considerations:

- The MUTCD identifies retroreflective sign posts as an option on speed limit signs. These should be considered for select locations.
- In well-defined neighborhoods, consider removal of redundant speed limit signs.

CONSTRUCTION

During construction, existing 30 mph speed limit pavement markings should be eradicated in advance of any sign replacement. This will reduce driver confusion during the transition.

The replacement of speed limit pavement markings (if re-installed at all) may follow at any time after sign replacement is complete. This phasing will allow flexibility for the striping contractor, whose schedule requires flexibility due to weather fluctuations.

5.2 Schedule, Phasing, and Next Steps

SCHEDULE AND PHASING

The previous speed limit sign inventory indicates approximately 2,800 speed limit signs are present on local streets within the Metro Nashville USD (excluding those located within Walking Districts, as these will not change). Conservatively, an anticipated construction timeline for this project would be approximately one (1) year.

The sign inventory and plans preparation process will require additional time. It is estimated that the inventory and design process will take four to six months.

Based on a one-year construction timeframe, it is recommended the project be divided into four relatively equal phases. The phases may be generally categorized by council district. It is recommended that the most central, urbanized districts be implemented first. These districts have environments that are the most conducive for self-enforcing speed limits given characteristics of the built environment, as well as having the greatest need given high volumes of vehicles, pedestrians, bicyclists, and other non-motorized users. The momentum gained within these neighborhoods will help to increase the likelihood for neighborhoods later in the implementation stages to comply with speed limit changes.

Following the updated signage inventory, this recommended phasing below may be revised:

Phase 1:

1. District 2
2. District 5
3. District 6
4. District 17
5. District 18
6. District 19
7. District 21

2. District 8
3. District 9
4. District 13
5. District 14
6. District 15
7. District 29

Phase 2:

1. District 7

Phase 3:

- | | |
|-----------------|------------------|
| 1. District 16 | 2. District 3* |
| 2. District 26 | 3. District 4* |
| 3. District 28 | 4. District 20 |
| 4. District 30 | 5. District 22* |
| 5. District 31* | 6. District 23 |
| 6. District 32 | 7. District 24 |
| 7. District 33 | 8. District 25 |
| | 9. District 27 |
| | 10. District 34* |

Phase 4:

1. District 1*

* Very small portion of this District is located within the USD

NEXT STEPS

As part of the Vision Zero effort, many cities have established a task force or committee comprised of a spectrum of stakeholders in order to approach safety from the most holistic approach possible while ensuring strategies are equitable. These task forces typically include representatives from a variety of sectors, including transportation, public health, police, fire, policy makers, and advocate groups.

Most often, these task forces are charged with the development of a Vision Zero Action Plan or similar near-term (5-year) guiding document. These plans present the goals of the community in terms of creating safer streets, outlines the near-term and long-term steps needed to achieve those goals, and details who is responsible for each step in working towards accomplishing those goals.

These task forces also typically play an active role in monitoring progress towards achieving goals outlined in the near-term action plan as well as providing direction to the municipality in further implementation of action items. This provides flexibility for the municipality to appropriately respond to and refine strategies based on data outcomes, as they become known. A similar task force in Nashville, whether specifically tailored towards Vision Zero or not, could provide a venue for several of the countermeasures discussed in Section 4, such as the sharing of data between MPW and MNPD.

National practice points to the need for a multi-faceted approach (education, engineering, and enforcement) in addressing the complexities associated with roadway safety and shifting cultural attitudes towards driving behaviors. While this study envisions a specific strategy of countermeasures to be identified by a group of representatives (ideally, a task force), specific countermeasures discussed in Section 4 that could be beneficial as part of a multi-pronged approach towards improving roadway safety in Nashville, include:

- Education – carry out a media blitz, “on-site” awareness campaigns, and establish a Pace Car Program.
- Engineering – continue to fund the Traffic Calming Program to evaluate roadways at a granular level and construct engineering countermeasures.

- Enforcement – the concept of enforcement is not limited to ticketing. Data sharing, education of the new speed limit by the police, and a Neighborhood Speed Watch Program are examples of enhanced enforcement that could have beneficial application in Nashville. The community should look to the experiences and creative strategies applied in Vision Zero cities to identify an appropriate enforcement strategy that does not unduly burden any specific populations, particularly those traditionally underserved.

The strategy should be rooted upon a strong foundation of data, and should be periodically monitored, to evaluate progress on meeting safety goals, while allowing Nashville-Davidson County to tailor its strategy accordingly.

5.3 Opinion of Costs

Without a current and accurate sign inventory, an engineer's opinion of probable cost must be based on general assumptions. Using the approximately 2,800 signs in the previous inventory as a base for assumptions, the estimated cost is approximately \$750,000 to \$1,000,000. Included in this opinion is the update to the signage inventory, four sets of design plans (one per phase), construction, construction engineering and inspection, an educational rollout, and a contingency.

6. CONCLUSION

In conclusion, the goal of the speed limit reduction on local streets within the USD is to increase safety for all roadway users. A slower operating speed for vehicles increases driver reaction times, reduces vehicle-stopping distances, and can increase sight distance, in turn, reducing the number and severity of collisions. This is especially true for our roadway's most vulnerable users – pedestrians, bicyclists, and other non-motorized users. The speed limit reduction implementation strategy is an important step in achieving the City's greater transportation, safety, and mobility goals as the region continues to grow and evolve.

The recommended implementation strategy is as follows:

- Speed limit reduction (30 mph to 25 mph) would apply to all locally classified streets with the Urban Services District (USD); however, a district-wide reduction in the GSD is not recommended. Neighborhoods and pockets of residential streets in the GSD could petition, however, to be included within the reduction.
- A reduction requires all existing 30 mph speed limit sign faces be replaced. Metro Public Works' speed limit sign inventory (with geocoded locations) will be updated, while also noting existing speed limit pavement marking locations, using MPW's photolog.
- Conservatively, the sign face replacement process would occur over the course of one (1) year with the project divided into four relatively equal phases. The phases may be generally categorized by council districts. The most central, urbanized districts will be implemented first, and then expanding outward from there. The opinion of probable cost is approximately \$750,000 to \$1,000,000.
- Countermeasures for addressing potential issues and concerns with the speed limit reduction are detailed in this report. They fall within three general categories – education, engineering, and enforcement. The education component will likely be the most effective before, during, and immediately following construction in supporting this broad scale change. Countermeasure strategies should be periodically monitored and evaluated in order to maximize resources and associated impacts on safety.
- A task force focused on improving roadway safety should be considered to identify a specific countermeasure strategy tailored to meet Nashville-Davidson County's dynamic needs. This task force could also provide important analyses of, and guidance on, the evolution of this strategy.