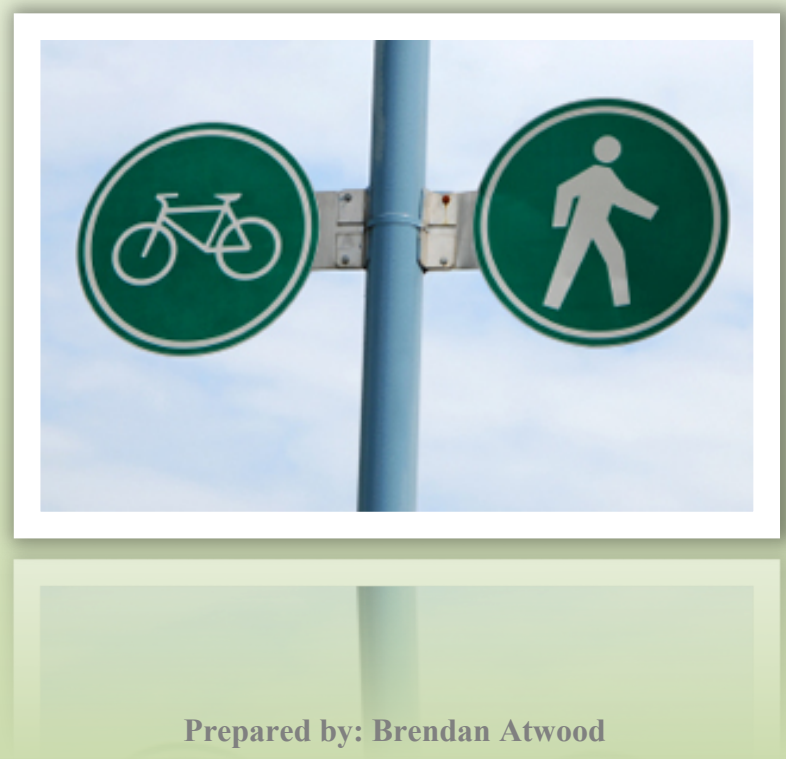
DRIVING CHANGE

A Policy Guide for TDM Integration in South Burlington



Prepared by: Brendan Atwood

Campus Area Transportation Management Association (CATMA)

June 2014

Campus Area Transportation Management Association CATMA

Chittenden County RPC
Communities Planning Together

southburlington
VERMONT

Table of Contents

1 EXECUTIVE SUMMARY 3

2 BACKGROUND 4

2.1 City Center (TIF District) 4

2.2 Development Challenges 5

2.3 Stakeholders 6

3 TDM OVERVIEW 7

3.1 What is TDM? 7

3.2 How is TDM Used? 8

3.3 Benefits of TDM 11

3.4 TDM & Municipal Government 11

3.4.1 TDM in South Burlington 12

3.5 Transportation Management Associations (TMAs) & CATMA 14

4 TDM STRATEGIES 16

4.1 TDM in the Land Development Process (LDP) 16

4.1.1 Comprehensive Plan & Form-based Codes 19

4.1.2 Impact Fees & TDM Fees 20

4.1.3 Development Agreements 21

4.1.4 Trip Reduction Ordinances (TROs) 22

4.2 Parking Management 24

4.2.1 Pricing 25

4.2.2 Maximums & Minimums 27

4.2.3 Unbundling 28

4.3 Municipal Coordination: Marketing, Outreach, Education & Engagement 28

5 CHALLENGES & SPECIAL CONSIDERATIONS 31

5.1 Language & Communication 31

5.2 Stakeholder Buy-in 32

5.3 Management 33

6 RECOMMENDATIONS 34

6.1 The Process: 35

6.2 Programs and Policies 40

6.3 Additional Policies for Consideration 41

7 CONCLUSION 43

Works Cited 45

ADDENDA 47

1 EXECUTIVE SUMMARY

Like many communities across the nation, the City of South Burlington, Vermont is engaged in a delicate act of balancing the City's long-term development goals with the environmental, social and economic pressures associated with such development. As the City moves forward with the development of a new City Center, traffic and parking congestion are anticipated to increase, adding pressure to an already burdened corridor in South Burlington.

Supply-side remedies aimed at increasing road and parking capacity are costly, both in time and money, and are generally inefficient means of realizing traffic mitigation goals. Fortunately, a more efficient set of strategies exists for policymakers'–Transportation Demand Management (TDM).

Through a suite of policies, TDM offers lower-cost solutions to an array of transportation needs, while avoiding many of the logistical and technical burdens associated with capacity upgrades. Moreover, TDM facilitates long-term and sustainable community buy-in by influencing commuter behavior.

TDM strategies can be integrated within many sectors of the community, and applied to various focus areas. For the purposes of this report, each of the strategies discussed pertain to one of three primary areas in which the City should focus their efforts in developing a comprehensive TDM program. They are: *TDM in the Land Development Process; Parking Management; and Municipal Coordination (Marketing, Outreach, Education & Engagement)*.

While many TDM strategies are employer-centric, this report focuses on what can be done at the municipal level to promote TDM integration, and thus includes only cursory mention of many TDM strategies that are best implemented by non-municipal entities.

This report is intended to provide the City of South Burlington with a road map to establishing and implementing an effective and comprehensive TDM program. The strategies outlined in this report represent national best practices, and have been assessed with specific consideration given for application in South Burlington's unique context.

Recommendations regarding the development and integration of a comprehensive TDM program by South Burlington City Staff are presented towards the conclusion of this report, following a discussion of potential challenges and special considerations inherent in the TDM development process.

The most critical recommendation included in this report is the process for developing a TDM program, outlined in section 6.2. Adherence to this process will maximize the long-term effectiveness of the program, while ensuring it is efficient, practical, and responsive to community needs and preferences as they evolve over time. Ultimately, the needs, preferences and resources reflected by South Burlington via the community engagement process will guide the appropriate suite of TDM strategies.

2 BACKGROUND

The City of South Burlington, located in Northwest Vermont, is home to about 18,000 residents, and is one of the State's most populous regions. Founded in 1865, South Burlington's 16.5[1] square miles are located between Lake Champlain and the Green Mountains, and just South of Vermont's largest city—Burlington. South Burlington is home to a vibrant commercial sector with nearly 2,300 private firms, led by hospitality, retail, medical, and corporate business communities with "regional and national reach,"[2] as well as Vermont's largest airport.

Over 10,000 South Burlington residents are employed in the labor force, of which 93% commute to work, averaging 15.7 minutes per commute.[3] The drive-alone rate in the City stands at 79%, with a 7.5% carpool/vanpool rate, and a 5% walking/busing rate.[4] Intersected by two major highways, South Burlington is also amongst the fastest growing communities in the State. According to the Chittenden County Regional Planning Commission (CCRPC), these development pressures have curbed efforts to "limit sprawl, and encourage denser, mixed-use development."[5]

In light of these development pressures, and the shortcomings recognized in the existing planning and development framework, a new approach was envisioned to limit sprawl and traffic congestion in the City, while accommodating compact, mixed-use growth. In 2013, the City formalized a new development plan for downtown South Burlington, known as the City Center/TIF District.

2.1 City Center (TIF District)

South Burlington is currently in the process of a major redevelopment effort—building a new downtown City Center. This City Center initiative seeks to build, "A walkable downtown core centered on the land south of Williston Road, east of Dorset Street, and north of Tributary 3 of the Potash Brook and west of Hinesburg Road."

[1] United States Census Bureau / American Fact Finder. "DP03 : South Burlington, VT Selected Economic Characteristics." 2008-2012 American Community Survey (ACS). U.S. Census Bureau's American Community Survey Office, 2012. Web. April 1, 2014.
[2] City of South Burlington. "Welcome". Web. April, 1 2014.
[3] US Census Bureau. "DP03."
[4] Ibid,
[5] URS. "Chittenden County TDM Education, Outreach and Support Program." Briefing Paper: TDM Regulatory Conditions: Barriers and Recommendations. Prepared for Chittenden County Metropolitan Planning Organization (CCMPO). December 21, 2004; Updated February 21, 2005. 7.

This project was introduced in the 1980s. In June 2013, the City Council directed the City Manager to undertake pre-construction steps to build the City Center as a Public Private partnership.[6] On August 27, 2013, the City adopted the Tax Increment Financing (TIF) District Plan, following the approval of the application by the Vermont Economic Progress Council (VEPC) in July 2013.

The TIF District is a financing tool offered by the State to stimulate economic development. In South Burlington, the TIF District designation allows the City to retain 75% of increases in tax returns (normally slated for the Education Fund and General Fund) to be used to finance infrastructure improvements in the District in furtherance of a vibrant, livable town center for the City. The TIF District is generally intended to contain compact, mixed-use developments that are easily accessible to pedestrians, cyclists and public transit. The District incorporates unique zoning ordinances and development requirements to promote this intended use. While Transportation Demand Management (TDM) was not the impetus for this initiative, the TIF District will promote demand management strategies simply through its design. Supplementary TDM policies can undoubtedly be incorporated to bolster these TDM benefits, and have been outlined in this report.

2.2 Development Challenges

Development pressures in South Burlington over the last decade have continued to increase developmental sprawl and traffic congestion in the City. South Burlington's transportation networks make the City a primary conduit for commuters who originate and end their trip in other communities (principally the City of Burlington), but who do not necessarily live or work in South Burlington. For those commuters who are employed in South Burlington, many come from other counties, which as the CCRPC acknowledges, "Represents a commuting pattern which does not lend itself to traditional transit solutions."[7] This is compounded by the large-lot zoning designations found in many South Burlington residential neighborhoods, which, "Encourages automobile travel and discourages use of TDM."[8]

In an effort to mitigate traffic congestion, the City has designated much of the City as an Overlay District, which establishes a cap on the peak-period vehicle trips on certain roadways and applies to developments that will impact traffic in the Overlay District.

[6] City of South Burlington. "TIF District". Web. April, 1 2014.
[7] URS. "Chittenden County TDM Education, Outreach and Support Program." Briefing Paper: Opportunities and Challenges. Prepared for Chittenden County Metropolitan Planning Organization (CCMPO). December 15, 2004; Updated February 23, 2005; Updated May 6, 2005. 3.
[8] URS. Opportunities and Challenges. 3.

While the Overlay District can be a useful tool, in its current inception, it lacks the flexibility required for the integration of TDM strategies that can help attain the desired traffic mitigation. Among the primary challenges concerning the use of the Overlay District as a traffic congestion mitigation tool, is that it does not distinguish or consider the use of alternative transport modes, nor encourage the use of creative solutions to traffic congestion. Traffic mitigation is only assessed relative to a traffic count based on a standard formula (developed by the Institute of Transportation Engineers, or ITE), which limits the scope and value for the purposes of TDM. A review of the Overlay District in the context of supporting TDM goals is recommended.

Procedural limitations also encumber the City's TDM efforts. For example, while shared parking (either via off-site or time of day arrangements) is permissible under City statute, the process for gaining approval of a shared parking agreement requires approval by the Development Board Review (DRB), and is permanent (unless repealed through the DRB). This complicates a process that the City should encourage, and disincentives shared-parking agreements, which support TDM efforts. Changes to these policies can be executed through Zoning Amendments, and should be considered to support the City's long-term TDM goals.

2.3 Stakeholders

In designing and implementing a comprehensive TDM program, the City must work closely with all relevant stakeholders in order to properly balance the various interests, goals and capabilities assumed by each party. Developers, employers and residents rank among the most prominent of these stakeholders, as they have the most at stake and retain the tools to assert the greatest potential impact. They also have unique interests and concerns.

In conversations with these stakeholders (the process of stakeholder engagement is described later in this report), the City should note the existing and anticipated future problems within the City concerning transportation and parking. The City should also assess the level of commitment and demand within the community for TDM measures, and identify strategies that are feasible in terms of the investment of time, money, management, and oversight.

Through close coordination with these stakeholders, the City of South Burlington can create an effective TDM program that limits the negative impacts of increased development while maximizing the benefits. An extended discussion of facilitating stakeholder buy-in is included later in this report, as well.

3 TDM OVERVIEW

3.1 What is TDM?

Transportation Demand Management (TDM) refers to a suite of strategies and policies that aim to optimize transportation system performance and efficiency within a region or community. This is achieved through a reduction or shift in the demand for transportation services based on changes in commuter behavior. Accordingly, TDM seeks to alter commuter behavior through a portfolio of incentives and disincentives, which decreases the value of commuting via Single Occupancy Vehicles (SOVs), and increases the availability and value of utilizing alternative modes of transportation.

Some TDM programs improve the transportation options available to commuters, while others provide an incentive to change travel mode, time or destination, while others yet reduce the need for physical travel through mobility substitutes or more efficient land use.[9] The structure and goals of any TDM program are determined by the needs and preferences of a given community.

The inception of TDM dates back to the 1970s, spawning from the compound community interests of conserving energy, improving air quality, and mitigating peak-period travel congestion. [10] Today, the aim of TDM is broader, and reflects the integration of concerns over the environment, quality of life, equity, mobility and accessibility, and economic and budgetary considerations.

Traditional approaches to transportation problems such as road congestion and parking deficiencies have primarily sought to increase capacity—generally through the construction of new road lanes or parking garages. In addition to the high financial cost of such supply-solutions, this strategy fails to appreciate the reality that many transportation and parking issues occur only within limited timeframes—such as peak commuting hours—making increased capacity outside of those times unnecessary at best, and counterproductive at worst. In contrast, TDM, optimizes cost efficiencies and transportation system performance through the application of comprehensive, complementary initiatives to manage demand at varying times and levels.

[9] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Proccess. By K.E. Seggerman and S.J. Hendricks. October 2005. Prepared for Florida Department of Transportation (FDOT).18.
[10] Federal Highway Administration (FHWA). Office of Operations. "Travel Demand Management." April 2004. Web. April 1, 2014.

It is important to note that TDM is most effective when integrated with a balanced transportation plan. TDM programs are not intended to replace existing transportation plans, but rather supplement and enhance them. Designed and executed properly, TDM can be an effective tool in a number of capacities, including:

- Managing the long-term demand placed on the transportation network, reducing or delaying the need for expensive capital investments;
- Expanding the array of transportation choices available to residents, employees, and tourists;
- Providing easy-to-implement, near-term solutions to current transportation challenges;
- Providing low-cost alternatives to capital projects with high financial costs or unacceptable community or environmental impacts;
- Providing enhanced mobility options for citizens that do not, or cannot, drive, including students and seniors; and
- Strengthening partnerships with private sector stakeholders, like major employers and developers, that are often an important financial contributor to the overall transportation network (in building parking and pedestrian/bicycle facilities, subsidizing transit passes, etc.).[11]

Accordingly, TDM seeks to expand transportation choices (especially to those individuals who are underserved from the existing transportation infrastructure); enhance public-private cooperation and synergies; and offer practical, cost-saving solutions to existing and future transportation and development challenges.

3.2 How is TDM Used?

Reflecting the broad applicability of TDM strategies, a number of arenas exist in which TDM can be implemented and achieve effective results, including:

1. City / County / Regional Transportation Plans;
2. Major Corridor Planning or (Re)Construction Projects;
3. Subarea Planning or Major (Re)Development Projects;

[11] UrbanTrans. Transportation Demand Management Toolkit. Prepared for Colorado Department of Transportation (CDOT). October 2002. 10.

4. Universities and Colleges;
5. Development Projects; and
6. Employment Sites. [12]

Indeed, integrating TDM into each of these sectors represents a comprehensive utilization of TDM, and can be self-reinforcing in a way that maximizes the benefits of each policy. In many cases, however, it is unrealistic to pursue such an extensive suite of reforms simultaneously—and may not even be necessary in many non-urban communities (such as South Burlington) in the short-run.

Instead, a prioritization of these applications—based on an assessment of the most pressing challenges and the anticipated time to institute the requisite reforms—can be a more useful (and expeditious) strategy in realizing TDM benefits. For example, recognizing that changing a city's Comprehensive Plan may require public hearings, referendums etc., it may make the most sense to initiate employer outreach to expand TDM at worksites in the short-run, while reforming the Comprehensive Plan and development requirements in the medium-long term.

Ultimately, the more comprehensive and redundant TDM policies are, the more effective they are likely to be. The broad integration of TDM within the public and private sectors should be a long-term goal for South Burlington policymakers. However, it is recommended that a more targeted approach is employed to initiate the development of the City's TDM program.

While TDM strategies can impart a broad impact on a local community, the ways in which these programs are implemented are more limited, and tend to include *at least* one of the following Core Strategies:

- Transit
- Inter-city Services
- Vanpools
- Carpools
- Walking/Bicycling
- Variable Work Hours
- Telecommuting.

These Core Strategies are most frequently supplemented with one or more of the following Support Strategies:

[12] UrbanTrans. Transportation Demand Management Toolkit. 9.

- Rideshare Matching;
- Guaranteed Ride Home;
- Parking Management Incentives,
- Marketing and Education;
- Market-Based Strategies;
- Intelligent Transportation Systems; and
- TDM-Friendly Design Considerations. [13]

Many of these strategies can be effectively addressed through employers—which is precisely where many TDM programs are initiated. The basis for this is rooted in the reality that work-related commuting accounts for a significant portion of total transportation demand within a region, and employers have significant leverage in altering employees' commuting behavior. There are a number of other important factors that make Worksites a desirable starting point for TDM strategies, as well. A discussion of some of these employer-based TDM programs are subsequently addressed in this report.

Wherever a TDM program is applied, and no matter how broad its scope, *it is a prerequisite of any effective TDM strategy to maintain an appropriate balance of incentives and disincentives that influence commuter behavior*. Increasing punitive actions (such as boosting parking enforcement), or imposing new fees or taxes may be useful components to a comprehensive TDM program, but are not sufficient policies in isolation. In addition to being politically unpopular, they do nothing to accommodate the desired shift to alternative transportation modes, and only act to move commuters away from the status quo.

A commuter cannot forego their vehicle if it is the only available mode of transportation that exists for their commute. Even for those commuters for whom alternatives exist, it is important to keep in mind that while expensive, the costs of owning an automobile are fixed, which provides motorists with an incentive to drive rather than use alternative transport modes.[14] Accordingly, complementary policies must be integrated, which expand the choices available to commuters, and incentivize the utilization of these preferred modes. Indeed, this is not always an easy task for communities--especially suburban municipalities such as South Burlington—but a number of effective incentive-based policies do exist, as outlined in this report.

[13] UrbanTrans. Transportation Demand Management Toolkit. 17.
[14] Victoria Transport Policy Institute (VTPI). TDM Encyclopedia. Web. April 1, 2014.

3.3 Benefits of TDM

TDM programs have increasingly proven to be effective transportation management tools in numerous communities around the nation over the last few decades. Significant reductions have been observed in a variety of important transportation measures, including single occupancy vehicle (SOV) trips, peak-period congestion, pollution, and the need to support additional capacity through new infrastructure.

Additional benefits have been realized through cost savings to municipalities, consumers and employers, as well as increases in community accessibility, equity, and livability. [15] In fact, according to the TDM Encyclopedia (an eminent policy resource and guide for TDM professionals), "When all impacts are considered, TDM is often the most cost effective solution to transportation problems."[16] With the application of comprehensive TDM programs, peak-period automobile trips can typically be reduced by 10-30% at worksites.[17] The issue of peak-period congestion is notably relevant to South Burlington, as this is one of the primary transportation challenges anticipated to impact the development of the City Center.

3.4 TDM & Municipal Government

Perhaps no entity has as much influence over the scope and effectiveness of a TDM program than the Municipal Government. The following statement describes the numerous ways in which local governments can affect TDM within the jurisdiction.

> ***"****Municipal Governments are responsible for local infrastructure, services and laws, and so play a key role in the TDM implementation through their influence on non-motorized facilities (sidewalks, paths and crosswalks), roadway design and management, public transit services, local land use policies, parking policies, taxes and fees, and traffic enforcement activities. Municipal governments significantly affect the quality of Mobility Options available in a community, particularly walking, cycling*

[15] VTPI. TDM Encyclopedia
[16] Ibid.
[17] Ibid.

and local public transit services, and overall community Accessibility." [18]

Accordingly, many of the most effective TDM policies include those designed, implemented and/or overseen by the City itself. There are a number of ways in which municipal governments can impact the role and value of TDM within their community, and these strategies will be discussed with the others in the proceeding sections.

For now, it is important to note that the TDM strategies adopted and pursued through City agencies are likely to define the net benefits from any TDM program. The City has the unique authority and capabilities to design a comprehensive and accordant TDM program. It is imperative that the City "leads the change" towards TDM, because even a robust TDM program is unlikely to achieve the desired benefits without the explicit and assertive support of City agencies—most notably the Planning and Development sectors.

3.4.1 TDM in South Burlington

As in many suburban communities, there is an opportunity to integrate Transportation Demand Management into South Burlington's community planning. In the City of South Burlington Comprehensive Plan, TDM is mentioned directly in only one brief paragraph (Strategy 55), which states, "The City should work with the private sector to explore opportunities to implement TDM, and that such TDM techniques should be considered as possible mitigation measures for potential adverse traffic impacts and development."[19] The Comprehensive Plan, and the ordinances in the Form-Based Code (FBC) which specify development requirements, also allude to and promote a number of TDM-related strategies (i.e. mixed-use development, and shared parking), though TDM is not the explicit goal of these ordinances.

Another tool uniquely available to the City is to leverage the existing Impact Fees ordinances to promote TDM goals. These Impact Fees, which must be paid by developers at the time a zoning permit is received, are used to fund capital projects as determined by the City. Offsets are permitted in lieu of fees, and the DRB has the statutory authority to waive these Impact Fees. TDM programs can

[18] VTPI. TDM Encyclopedia.
[19] City of South Burlington. Comprehensive Plan, 2012-2016. "Strategy 55." 2-8.

be funded through the assessment of these Impact Fees. Alternatively, the City can approve TDM measures as legitimate Impact Offsets.

Another TDM tool at the City's disposal is found in the State's enabling legislation for zoning: V.S.A. Title 24 Part 2, Chapter 81, Section 4407 (4), which authorizes Vermont municipalities, "To allow trade-offs of required parking spaces for employee use of transit." The CCRPC points out that this authority is not widely employed in Chittenden County, though it is not clear what accounts for this underutilization.

Zoning ordinances guiding City Center development allow the DRB the use of additional TDM tools. For example, in regards to parking in the City Center, the DRB is permitted to waive or modify parking requirements, or accept in-lieu fees when certain mass transit options are available at or in proximity to the proposed development. [20]

Updates to the FBC are anticipated within the next year, and include an across-the-board reduction in minimum parking requirements. This revision will afford developers greater flexibility in the amount of parking they will need on site, thus reducing a disincentive to invest in alternative transportation modes. This ordinance does not tie the required parking reductions to any specific TDM actions, and thus misses an opportunity to directly incentivize the integration of TDM measures into a development. Overall, this policy marks progress towards TDM integration, though it may benefit from further amendment down the road.

Beyond these cursory references, TDM is not explicitly integrated into the Land Development Process, nor are specific TDM goals outlined in the Comprehensive Plan. To some extent, this may be a reflection of the limited transportation challenges currently facing South Burlington, which does not suffer from any parking deficiency, for example. That being said, the City is challenged by a number of existing and projected transportation concerns, including peak-period congestion. Importantly, the need to institute a comprehensive TDM program in South Burlington—especially for the City Center—has been recognized by City Planning officials.

One of the fundamental reasons for a lack of TDM in South Burlington may stem from a perceived lack of need for such measures from community businesses, developers (and even some City officials--at least in the short-term). While the momentum is shifting towards greater acceptance of TDM by stakeholders, the

[20] City of South Burlington. Comprehensive Plan, 2012-2016. 2-8.

onus remains on the City to define the path and lead the change towards a more widespread and comprehensive TDM program within the community. This report is intended to help guide this effort.

The recognition for the value of TDM is more evident in County-wide planning documents. The 2013 Chittenden County ECOS Plan combines three plans—the Regional Plan, the Metropolitan Transportation Plan (MTP), and the Comprehensive Economic Development Strategy (CEDS) into one integrated document. It is within the MTP—the region's principal transportation planning document—that TDM is presented and promoted as a planning tool. The MTP establishes both short-term and long-term transportation priorities for the County, and acknowledges the potentially significant impacts associated with widespread TDM program implementation in the region.[21]

3.5 Transportation Management Associations (TMAs) & CATMA

Transportation Management Associations (TMAs) are often valuable partners in the effort to expand TDM, owing to their expertise and unique role in fostering partnerships between the public and private sectors. While TMAs are by no means monolithic, each of the nearly 200 TMAs across the United States share a number of important characteristics.

TMAs are non-profit, member-controlled organizations that provide transportation services in a particular geographical area.[22] Members typically include large area employers and businesses, and receive support from local governments and Metropolitan Planning Organizations (MPOs), like the CCRPC.

While TMAs are not requisite for successful TDM programs, their involvement and support in implementing these initiatives has proven highly effective towards these efforts. The TDM Encyclopedia, a resource for TDM professionals, describes the value of TMAs as in the following way:

> *"TMAs provide institutional framework for TDM programs and services. They are usually more cost effective than programs managed by individual businesses. TMAs allow small employers to provide Commute Trip Reduction services comparable to those offered by large companies. They avoid problems that may be*

[21] Chittenden County Regional Planning Commission (CCRPC). "2013 Chittenden County Environment, Community, Opportunity, Sustainability (ECOS) Plan." June 19, 2013.
[22] VTPI. TDM Encyclopedia.

associated with government-run TDM programs, since they are controlled by members."[23]

Across the United States, TMAs provide a variety of valuable services to members, non-members and to the general public, including the following:

- *Employee Transportation Coordinator training*
- *Rideshare matching*
- *Telecommuting program assistance*
- *Subsidized transit passes*
- *Direct rideshare incentives*
- *Shuttle/Local transit provision*
- *Direct shuttle service operation*
- *Guaranteed Ride Home*
- *Vanpool subsidy program*
- *Regional/Local advocacy*
- *Site design assistance*
- *Multilingual translated information*
- *Active living program*
- *Promotional events*
- *Trip reduction plan preparation*
- *Parking service provision*
- *Parking pricing and/or management*
- *Promotional materials/newsletters*
- *Tax benefit program assistance*
- *Carshare program*
- *Bicycle program*
- *Cycling Safety workshops*
- *Walking program*
- *Pedestrian amenity review*
- *Visitor services*
- *Relocation assistance*
- *Electric vehicle promotion*
- *Construction/traffic advisories*
- *Government reporting/compliance*
- *Alternative fuel infrastructure development.* [24]

With TDM, it can be difficult to parse out the impact of specific policies using the various metrics available to gauge program effectiveness. Reduced congestion, for example, is not easily attributable to any singular variable, as there are a number of factors (some outside the purview of TDM entirely), which are likely to influence this measure. Nonetheless, attempts have been made to measure the effectiveness of TMAs in this capacity. A 1996 study by the TDM Resource Center found that TMAs "Typically reduce a *minimum* of 6-7% of total commute trips, and more if implemented in conjunction with transit improvements."[25] Other typical benefits include a reduction in SOV trips, decreased pollution, and overall greater community integration of TDM programs.

CATMA, the Campus Area Transportation Management Association,[26] the regional TMA, has partnered with the City of South Burlington and the CCRPC to expand

[23] VTPI. TDM Encyclopedia.
[24] Ibid.
[25] UrbanTrans. Transportation Demand Management Toolkit. 67.
[26] Note: CATMA is anticipated to transition into the Chittenden Area TMA by 2015.

TDM within the City (with this report representing one component of this initiative). Future cooperation between the City and CATMA is likely, as the regional scope of TDM continues to be broadened at the County level. A cooperative, professional relationship between CATMA and the City of South Burlington should be sustained and built upon in order to maximize the TDM benefits realized by the community.

4 TDM STRATEGIES

Transportation Demand Management is a necessarily broad concept from which a suite of distinct strategies focused towards specific applications are derived. The following section details a number of those strategies proven to be most effective in communities across the United States, and which are most pertinent to the City of South Burlington's specific attributes, needs and capabilities. This assessment includes an overview of each strategy, as well as a discussion on its applicability to South Burlington's TDM program. While by no means exhaustive, the following list provides a useful starting point for assessment in furtherance of initiating a comprehensive TDM program in South Burlington.

The strategies discussed below have been grouped into sections based on the policy application, and together represent a "Three Pronged TDM Program Strategy." The three prongs are: *TDM in the Land Development Process; Parking Management; and Municipal Coordination (Marketing, Outreach, Education & Engagement).*

The appropriate suite of strategies, along with their specific impacts, will depend on the evolving needs and preferences of the City of South Burlington, and should be reassessed routinely. The synergistic effects of implementing certain policies concurrently are also important to consider in the interest of maximizing the benefits realized through a TDM program.

The following section will provide an overview of each TDM policy, and indicate its relevance to South Burlington's TDM objectives. Specific recommendations regarding the application of these policies by the City of South Burlington is reserved for a latter section of this report.

4.1 TDM in the Land Development Process (LDP)

The Land Development process is, in many ways, the backbone of an effective local TDM program. Zoning and Development requirements can either reinforce

and promote TDM goals, or they can conflict with and undermine those goals—something the CCRPC has noted.[27] However, it is within the land development process where the two philosophies to transportation system development and management—*managing vs. accommodating*—come into conflict and can therefore be potentially resolved.[28]

Integration of TDM into the Land Development process is supported by the CCRPC, which recommends that municipalities, "Consider amending their regulations to specifically address TDM and the considerations under which it is either required or recommended…including quantifiable standards against which proposed TDM program elements can be measured."[29]

Incorporating TDM into the LDP can be done in various ways, and integrated at multiple levels within the process. The most frequently employed mechanisms for the integration of TDM into official regulations and policy include:

- *Changes to the Comprehensive Plan and Form-Based Codes*
- *Impact Fees & TDM Fees*
- *Development Agreements*
- *Trip Reduction Ordinances (TROs)*

Prior to a discussion of these specific policies, however, it is helpful to consider a few general points in determining which strategies are best suited for the City of South Burlington.

TDM is most effective when transportation efficient development and TDM strategies are planned and implemented comprehensively (in all stages of the Land Development Process) at the local level.[30] Moreover, "In a voluntary environment, TDM with no formal structure in place, strategies can be inconsistently incorporated into development applications and are not verified to ensure they are implemented as proposed." Accordingly, the most successful TDM programs typically rely on continuing, enforceable ordinances.[31]

[27] URS. Opportunities and Challenges. 5.
[28] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. vii.
[29] URS. Opportunities and Challenges. 5.
[30] SANDAG. "Integrating Transportation Demand Management into the Land Development Process." May 2012. 5.
[31] SANDAG. 13.

Opposition from businesses and developers to onerous or costly TDM mandates is all but assured, and political wrangling may ensue. A number of additional considerations can help to curb this potential backlash.

All relevant Stakeholders must be included in the process of reforming official procedures, ordinances and laws. This will not only limit dissent to statutory or procedural changes that are ultimately made, it will also ensure that the new TDM rules are suitably balanced with the interests of those whom the City is relying upon to develop the City Center.

Any mandates adopted need not be onerous, and should be complemented with incentive structures that provide net benefits to each stakeholder.

It is important that TDM is incorporated into all stages of the Land Development Process, making it integral to the process, rather than ancillary. This requires that TDM be incorporated in "Long range transportation and land use planning stages, through land use regulatory regimes, and continuing through site development negotiations and property management stages."[32]

As South Burlington initiates a novel TDM program, the City should seek to assume a cooperative, guiding role in assisting stakeholders with TDM integration, rather than attaining compliance through punitive actions. It is important to recognize that the process of integrating TDM within the private sector is often time-consuming, unfamiliar and of low priority. Penalties for delayed or inaction should be utilized as a last resort, and applied only after all reasonable attempts on behalf of the City to assist with an organization's TDM integration have been exhausted. In short, the City will likely facilitate the greatest cooperation by positing itself as a helpful partner in TDM rather than as a regulatory authority.

Finally, in promoting TDM, it is incumbent upon the City staff to facilitate a positive business relationship with developers in order to attract the desired clientele. Central to this endeavor are the following considerations, which may influence whether a proposed development remains worthwhile and profitable:

- Certainty of the process;
- Fair treatment in relation to business competitors as well as in relation to the negotiated responsibilities of the developer and the

[32] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 13.

host local government;
- Flexibility in solution seeking; and
- Respect for time constraints of the land development process.[33]

Adherence to these values will help to limit opposition to TDM reforms, and may strengthen stakeholder buy-in of these initiatives.

4.1.1 Comprehensive Plan & Form-based Codes

Two of the primary tools used by City Planners are the Comprehensive Plan, which establishes the policy framework guiding new development; and the Form-based Codes, which specifies the Land Development Regulations for development.[34] Both documents are routinely amended, and it is within these documents that local governments can specify TDM goals and specific TDM strategies.

Accordingly, it is integral that the fundamental TDM goals are outlined in the Comprehensive Plan and reflected in the Form-based Codes, which will support and guide the integration of TDM concepts within the City more broadly.

Incorporating TDM policies into the Comprehensive Plan typically involves the following steps:

1. An analysis of the existing transportation network,
2. Development forecasts of future transportation needs,
3. Assessment of fiscal and other limitations, and
4. A discussion of community goals and objectives for future transportation investments.[35]

In other words, TDM policies should be adopted and implemented in accordance with the context of what is feasible based on a comprehensive assessment of the variables addressed above. It is important that this process is revisited on a regular basis (most likely in accordance with the 5 year updates required of the Comprehensive Plans), and revised as deemed necessary by the City and relevant stakeholders.

[33] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 24.
[34] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 22.
[35] UrbanTrans. Transportation Demand Management Toolkit. 10.

Cambridge, Massachusetts offers a useful example regarding the effectiveness of mandatory TDM ordinances.[36] While Cambridge's regulations include enforcement provisions, they are buttressed by mechanisms to provide assistance to non-compliant businesses, reflecting the preference by the City to foster cooperation in the private sector rather than invoke punitive measures to advance TDM integration.

Examples of how TDM can be successfully incorporated into mandatory ordinances are included as *Addenda* to this report.

4.1.2 Impact Fees & TDM Fees

Another set of tools includes the use of fees, which either require or encourage developers to adopt TDM policies, while simultaneously providing a source of funding for future TDM programs. The structure of a fee system can be designed in a number of ways.

Impact Fees are defined as, "Charges imposed upon private land developers by a governmental entity to fund the additional service capacity required by the development for which it is collected."[37] Impact Fees are often applied to a specific geographic area (i.e. City Center), and in some cases are designed to allow developers to offset a portion of the impact fee by paying for traffic mitigation or public infrastructure, or by adopting certain TDM measures.

The State of Vermont permits the use of Impact Fees by municipalities under the statute 24 V.S.A., §§5200. According to this enabling legislation, the purpose of authorizing Impact Fees is, "To enable municipalities to require the beneficiaries of new development to pay their proportionate share of the cost of municipal and school capital projects which benefit them and to require them to pay for or mitigate the negative effects of construction."[38]

A similar strategy, and one adopted with success by Rockville, Maryland, establishes that TDM Fees be applied to all new development. In this system, fees are collected from any new development within a defined geographic area and deposited into a TDM Fund for future initiatives (such as the construction of bike

[36] Nygaard, N. Traffic Reduction Strategies Study. Prepared for the City of Pasadena. 2006. Web. April 1, 2014.
[37] Montana Department of Transportation. "Montana Transportation and Land Use." Web. April 1, 2014.
[38] 24 V.S.A., §§5200.

paths or bus shelters). As established in individual agreements with developer applicants, the fee in Rockville is $0.10 for commercial and retail developments, and $60 per unit for residential development for a 10-year period. [39] Because this fee system is standardized, and does not necessitate any type of preliminary assessment by either a developer or government agencies, it may be more amenable to stakeholders. On the other hand, this fee structure may also impose the greatest relative burden on small-scale developments, which otherwise may not be required to pay anything under an Impact Fee policy. The value of this policy, as with all others, should be carefully assessed by the City of South Burlington, in coordination with the relevant stakeholders in order to determine the ultimate value.

4.1.3 Development Agreements

A Development Agreement is a, "Formal, consensual, binding contract between a local government, the land developers/owner, and if appropriate, other parties,"[40] that ties land development rights to the provision of public facilities. "Among other things, Development Agreements must include a legal description of the land, its owners, a timeframe for the agreement not to exceed 10 years, permitted uses, and information regarding the roles and responsibilities of the parties in terms of the provision of public facilities, confirmation of consistency with the local government's comprehensive plan and LDRs."[41]

Development Agreements can require either on-site amenities (such as shower facilities, bike racks, or preferential parking for carpools) or off-site amenities (such as bus shelters, or sidewalk improvements), or both. Off-site amenities are generally identified as part of an overall transportation plan, so that improvements are coordinated with local and regional needs. The best time to ensure that TDM improvements are included in a development is before construction begins, when a permit is being negotiated.[42]

Incorporating incentive structures into a Development Agreement can foster greater support from developers, making negotiations easier. Concessions on parking minimums and density requirements, streamlined reviews, and/or bid

[39] SANDAG. 12.
[40] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 22.
[41] Ibid.
[42] SANDAG. 15.

preferences, for example, can go far towards making Development Agreements more amenable to developers.

4.1.4 Trip Reduction Ordinances (TROs)

According to the United States Environmental Protection Agency (EPA), Transportation Reduction Ordinances (TROs) are, "Local, regional, or state government requirements designed to encourage the use of transportation alternatives…rather than a single occupant vehicle."[43] TROs are most often forged with developers, employers and building managers, since work-related commutes tend to account for the majority of traffic and peak-period congestion. In this way, TROs are similar to Development Agreements. The distinctions between the two tools are reflected in their application—Development Agreements apply to developers and may be unique to each development, while TROs can apply to a broader contingency, and tend to be more standardized (in accordance with the language of the adopted ordinance).

TROs can be designed in a number of ways, and may include either prescriptive or proscriptive language. In most cases, a TRO will require ,"A certain reduction in trips with rewards and penalties set for achievement or nonattainment of goals."[44] A Trip Reduction Plan can be mandated as part of the building permit process, and outline various strategies to accomplish the desired reductions (i.e. on-site and off-site improvements, unbundled parking, parking maximums etc.). Typically, a TRO will include the following components:

- A Trip Reduction Plan (TRP) that is consistent with local transportation policies;
- Baseline survey and monitoring;
- Requirement to submit an annual report, including description of worksite characteristics; and
- A timetable for compliance (including response to non-compliance).[45]

TRO measures tend to be programmatic in nature, and are, therefore, oriented to property managers and tenants most often. Accordingly, TROs are best suited for

[43] United States Environmental Protection Agency (EPA). "Trip Reduction Ordinances." n.d. 2.
[44] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 13.
[45] Hendricks, S.J. "Land Use & Development Regulation: TDM's Role in Making Them More Effective." Presentation for the Association of Commuter Transportation International Conference. July 30, 2013.

use in the final stage of the land development process, when these actors are required to carry out a specific plan developed for a given worksite, as approved by the host local government.[46]

TROs are regulatory instruments, and therefore run the risk of being perceived by business groups as heavy-handed. Despite this, over forty municipalities in the United States have TROs in place, and they have been proven be an effective TDM tool.[47] As with the other strategies discussed above, enforcement provisions are discretionary.

A proactive alternative to sanctions (such as the assessment of fines or the denial of permitting), is to require that developers or property managers purchase membership in an existing TMA.[48] This policy can alleviate the logistical pressures on developers while maximizing the effectiveness of TDM programs. While paid membership may not be feasible for all businesses, TMA membership for large developments and employers, in particular, should be closely considered, along with the other regulatory instruments outlined in this report.

The City of Burlington, for example, requires that any "Post-secondary educational or medical institution within the Institutional district" observe a number of TDM policies, including the provision of off-site parking, and the submission of Parking Management plans.[49] The three institutions within that district—Fletcher Allen Healthcare, University of Vermont, and Champlain College—jointly founded CATMA to manage these TDM programs. Through the utilization of a TMA to manage parking for these institutions, a significant reduction (~ 18%)[50] in the use of SOVs amongst employees has been achieved.

It is important to note that the Chittenden County Regional Planning Commission does not believe a mandatory TRO ordinance to be a beneficial policy for Chittenden County due to, "Constraints on local governments for implementation, enforcement issues, and potential impacts to future economic development." The CCRPC also notes that such a policy may undermine existing public-private partnerships without sufficiently advancing the goals of TDM.

---

[46] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 43.

[47] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 43..

[48] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 47.

[49] Comprehensive Development Ordinance, City of Burlington, Article 8, Sec.8.3.1. Web. May 30, 2014.

[50] Campus Area Transportation Management Association (CATMA). "Annual Fall Employee and Student Survey (Fletcher Allen, UVM, Champlain College), 2000-2012."

Instead, municipalities are encouraged by the CCRPC to, "Include a comprehensive set of TDM provisions within their zoning regulations to require all new businesses (of a given size) to provide TDM as a means to reduce single-occupancy trips generated by a proposed development.[51]

4.2 Parking Management

Parking Management refers to a set of strategies that can reduce the demand for parking and promote more efficient use of existing parking infrastructure.[52] Management of parking is an essential component of effective TDM program due to the impact parking availability has on commuter behavior.

Simply put, free or inexpensive parking leads to over-use—often by long-term parkers—limiting access to businesses catering to short-term parkers.[53] The over-use of parking—as in South Burlington's congested downtown—has detrimental implications for TDM and development aspirations, including increased traffic congestion, as free parking bolsters the comparative value of automobile use over alternative transport modes.

Additional benefits from Parking Management include: ensured access to retail businesses, access for visitors to local attractions, and improved neighborhood vitality.[54] Moreover, while building increased parking infrastructure is a costly enterprise (and no longer cost-effective)[55], Parking Management is much less expensive, and can actually generate revenue. For this reason, Parking Management is a unique strategy within the TDM portfolio, and deserves careful consideration from South Burlington policy-makers.

The suite of potential Parking Management policies is both expansive and evolving. For the purposes of this report, three primary strategies are addressed, based on the anticipated potential value of their application in South Burlington. They include: *Parking Pricing* schemes; the use of *Parking Maximums and Minimums*; and *Parking Unbundling*.

[51] URS. TDM Regulatory Conditions: Barriers and Recommendations..
[52] Seattle Urban Mobility Plan. "Best Practices: Transportation Demand Management." January 2008. 7B-
[53] Nygaard, Traffic Reduction Strategies Study.
[54] Ibid.
[55] Ibid.

4.2.1 Pricing

Nationwide, 99% of automobile trips end with free parking.[56] This is significant in light of the fact that commuter behavior is strongly influenced by the cost and availability of parking. In fact, "The supply and price of parking serving a worksite have the single largest effect on the performance of *employer-based* TDM programs." According to one recent study, sites with restricted parking average about 28% reduction in vehicle trips when supported by transportation services (such as carpools, bus service, etc.), and about a 20% reduction when implemented in isolation.[57] Other studies have estimated a 20-30% reduction in vehicle trips when charging for previously subsidized parking.[58]

Certainly, providing transportation services bolsters the effectiveness of parking management. Yet, a side-by-side comparison indicates that restricted parking averages about twice the impact of providing services.[59] Given that the provision of services costs money (either to businesses or the City), while Parking Management can be a revenue generator, it makes fiscal sense to bolster existing transportation services with parking management policies to attain TDM goals.

The basis for these potentially significant impacts on commuter behavior derived from Parking Management schemes is attributable to the complementary incentives and disincentives embedded in the strategy. Limited and priced parking *decrease* the appeal of driving alone while *increasing* the appeal of travel alternatives.[60] This appeal can be enhanced through reinforcing policies that provide further benefits to alternative commuters, such as free or preferential parking for carpools and vanpools, or a transit subsidy, for example.

The cost of parking should be determined by some function of demand for parking, and potentially the vehicle occupancy of a specific trip. The time period governing fee assessment is less important, and may be hourly, daily or monthly. Importantly, the parking fees need not be excessive in order to realize Vehicle Trip Reductions (VTRs).[61]

---

[56] United States Bureau of Transportation Statistics (BTS). "1990 Nationwide Personal Transportation Study (NPTS)." 1990.
[57] Transportation Research Board of the National Academies. Transit Cooperative Research Program (TCRP). "Report 95: Employer and Institutional TDM Strategies." Washington D.C. 2010. 30
[58] SANDAG. 19.
[59] TCRP, 30
[60] TCRP, 19-57
[61] UrbanTrans. Transportation Demand Management Toolkit. 67.

One of the challenges with priced-parking is that these policies are generally best implemented by employers, who tend to own the parking spaces, and who are best positioned to influence employee behavior. As a result, the City of South Burlington has limited tools to unilaterally implement priced-parking, making it especially important for the City to foster and maintain close working relationships with employers through whom these measures are to be promoted.

One strategy the City can adopt, however, is to mandate *in-lieu parking fees* (when a developer pays into a fund rather than build required parking spaces) from a building's owner and/or tenants, which can encourage shared-use facilities and fund more broadly oriented parking improvements, or transit subsidies.[62] Based on the anticipated opposition to such a mandate from the business community, a voluntary program may be most practical.

Similarly, a Parking Tax assessed for specific types of commuters (i.e. peak-period travelers) is also an option, and one that is likely to face considerable community opposition, and may be difficult for the City to manage effectively.

Finally, The City is in a position to implement *on-street priced parking*, however there is a dearth of on-street parking availability in South Burlington, and this strategy will not be effective as long as abundant free parking exists in nearby parking lots.

In summary, priced-parking presents one of the most effective strategies for altering commuter behavior and reducing vehicle trips to a given site, but is implemented most effectively through employers.

Given the limited resources and potential challenges associated with instituting parking fee mandates, *the City should explore opportunities for an independent organization to manage and broker parking within South Burlington.* Through a Parking Management Association, regional parking spaces can be shared or allocated more efficiently among businesses through lease agreements, providing financial and logistical benefits to all parties—including the City. However, amendments to City Codes allowing for these changes to the minimum-parking requirements will be necessary, making this strategy a useful medium to long-term consideration for South Burlington's comprehensive TDM program.

[62] UrbanTrans. Transportation Demand Management Toolkit. 39.

4.2.2 Maximums & Minimums

The Form-Based Codes (FBCs) which define development requirements within South Burlington mandate minimum parking standards based on the size or occupancy of a development. Pending revisions to the South Burlington FBCs mandate lower parking minimums than previously required, but are not tied to any TDM actions.

While less than ideal, a lower parking requirement does have positive implications for TDM goals. "Minimum parking requirements increase the supply and reduce the price–but not the cost–of parking".[63] Therefore, the minimum requirement undermines efforts to reduce the attractiveness of driving and formalizes a default expectation for automobile use over alternative modes. Indeed, the CCRPC specifically identifies inflexible parking requirements, including parking minimums—as factors which can undermine and conflict with TDM goals. [64] Lowering these minimums is a step in the right direction, but even low parking minimum requirements can undermine TDM goals.

A number of policies exist which can alleviate the pressures that parking minimums exert on TDM goals. One strategy is to allow for further reductions to the minimum parking requirement for developers and employers who adopt specific TDM measures—such as installing bike racks, or providing subsidized bus passes to employees.

Another policy that has been quite successful is the use of *Parking Maximums*, which cap the amount of parking spaces allowed per square foot of commercial office space in downtown areas. [65]

Each of these strategies elevates the value of alternative transport modes relative to SOVs. Importantly, they also have positive financial implications for developers and tenants. Minimum parking requirements can increase development costs (which are generally passed on to tenants), reduce overall supply (by requiring more land to accommodate parking rather than better uses) and hinder redevelopment (by increasing costs and limiting buildable land).[66]

---

[63] Schoup, D.C. "The Trouble With Minimum Parking Requirements." Transportation Research Part A, Vol. 33. December 9, 1999. 549-574.
[64] URS. Opportunities and Challenges. 5.
[65] Seattle Urban Mobility Plan. "Best Practices: Transportation Demand Management." 7B-3.
[66] State of Maryland Govenor's Office of Smart Growth. "Driving Urban Environments: Smart Growth Parking Best Practices." Prepared by Robin Zimbler. 2002.

Accordingly, reducing or eliminating parking minimum requirements is generally in the interests of the business community, and may bolster the impetus to develop a collaborative community-wide TDM program.

4.2.3 Unbundling

Another alterative to the abolition of parking minimums is to "Unbundle" parking costs—requiring that parking spaces be leased or sold separately from the rent or sale price of a development. When bundled together, the overall lease costs can increase by as much as 25%, regardless of whether the tenant has a car.[67] Similarly, retailers pass along to consumers the costs of increased rent associated with bundled parking through higher prices for goods and services.[68] The inclusion of parking in the cost of a lease acts as a disincentive to invest in accommodations for alternative transportation modes.

In addition to allowing for the preservation of the parking minimum (which may ultimately be the long-term preference for South Burlington), unbundling provides a financial incentive for individuals to drive less or own fewer cars, and for employers to increase transit commute rates among employees and reduce the overall parking spaces needed. More broadly, unbundling reduces parking demand, and increases the demand for alternative transportation modes.[69] The increased flexibility afforded to developers, employers and tenants provides a costs savings opportunity while reducing the incentive to utilize an automobile rather than an alternative mode.

4.3 Municipal Coordination: Marketing, Outreach, Education & Engagement

At the core of any effective TDM program must exist a robust campaign to extol the benefits of TDM, and to guide the community towards incorporating these strategies at various levels. A lack of community awareness—regarding both the value of TDM, as well as the costs of inaction—is often the most significant initial challenge to broad TDM integration. One of the benefits of integrating TDM into all levels of the Land Development Process (as discussed above) is that it reinforces awareness of TDM among developers, as well as the City's commitment to TDM. Yet, the need to educate about TDM extends beyond just the developers, as the

[67] Seattle Urban Mobility Plan. "Best Practices: Transportation Demand Management." 7B-2
[68] Schoup, D.C. "The Trouble With Minimum Parking Requirements."
[69] Seattle Urban Mobility Plan. "Best Practices: Transportation Demand Management." 7B-2

most successful programs engage employers and the general public while becoming embedded in the culture of both groups.

Marketing of TDM strategies address commuters in three primary areas: *Awareness; Try; and Maintain.* People must know about a program and the potential benefits, first and foremost. They must then be convinced to try an alternative mode of transportation at least once. Finally, once people try alternative modes, the message needs to shift towards maintaining that individual's participation in an alternate mode.[70]

These last two areas: *try* and *maintain* present the most significant challenges for marketers. In order to convince an individual to switch transport modes, they must: be convinced of the inherent value of changing their behavior; have access to the pertinent information that allows them to understand their options; and be motivated to try and continue using the alternative mode(s).[71]

One of the simplest ways in which municipal government can affect these changes is through City-sponsored training workshops for businesses and developers, or for municipal staff, such as those on the DRB and Planning Commission. For developers, these workshops can be either mandatory or voluntary, as per the LDR process, given the City has the resources to conduct or fund these workshops. Alternatively, TMAs can fill this void, and may be the preferred mechanism for doing so, based on their unique level of expertise in TDM, and their relationship with the business community.

The CCRPC, which supports the use of these workshops to promote TDM, should be utilized as a resource for developing and facilitating these trainings, even if they do not host them. According to the CCRPC, the suggested topics for these workshops include:

- The benefits of TDM as a component of land development;
- Approaches for including TDM requirements in the zoning regulations;
- How to develop a TDM plan for an individual development;
- How to conduct an impact assessment for SOV trips and trip reductions possible with TDM;
- Approaches for public/private partnerships in land development incorporating TDM;

[70] UrbanTrans. Transportation Demand Management Toolkit. 43.
[71] TCRP, 19-21

- Monitoring and enforcement issues for TDM plans provided in association with development approvals." [72]

Another useful and efficient means of marketing is via local businesses, which have direct access to, and influence over, the behavior of employees. TDM programs instituted through employers shift many of the financial and logistical burdens of program implementation from municipalities onto businesses, which present obvious benefits from the perspective of City staff. Moreover, because employers have numerous tools through which to implement TDM measures, they are generally better positioned to achieve significant, ongoing changes in commuter behavior compared to municipal governments, which have limited resources to influence the travel behavior of community residents and employees.

Reflecting the importance of employer-based TDM programs, the EPA Commuter Choice program has established National Standards of Excellence in Commuter Benefits. To meet these standards, employers must offer:

- Guaranteed ride home.

- Employer-paid Transit/Vanpool Benefits where the employer provides at least $30 per month in benefits or the full value of commuting costs.

- Parking Cash Out where the employer provides the option of cash instead of parking. CCLI requires the employer to offer at least $30 per month and at least 75% of the actual saved costs of parking to classify this option as a primary benefit.

- Telecommuting as a primary benefit requires the employer to meet or exceed a 6% average participation rate as expressed as the percent of employees telecommuting on an average day (e.g., 10% of employees who telecommute an average of 2 days per week would not meet the standard).

- Employer-defined benefits can allow employers to use other strategies to achieve the standards. Employers must achieve demonstrable benefits the Federal Commuter Choice Team must agree if an option is to qualify.[73]

[72] URS. TDM Regulatory Conditions: Barriers and Recommendations..pg 8
[73] EPA. "Trip Reduction Ordinances." 7.

The value of employers promoting TDM cannot be overstated. It is for this reason that priority should be given by the City of South Burlington to engagement with the business community, in furtherance of employee-oriented TDM policies.

5 CHALLENGES & SPECIAL CONSIDERATIONS

Transportation Demand Management offers policymakers a great deal of flexibility in their efforts to improve the efficiency of local transportation networks by providing a suite of low-cost strategies which can be applied within multiple levels and sectors. While there are clearly significant benefits that TDM offers in comparison to supply-side transportation management initiatives, a number of challenges remain which can endanger the effectiveness or sustainability of a TDM program.

To avoid such pitfalls, three policy elements deserve close attention from City staff as they develop a comprehensive TDM program: *Language; Buy-In; and Management*. A programmatic deficiency in any one of these areas can effectively undermine the entire TDM regime. Therefore, it is imperative that sufficient effort is devoted to the following elements in order to limit disruption and maximize program efficacy.

5.1 Language & Communication

The importance of clarity and consistency in the communication of TDM policy cannot be overstated. Whether in official Planning documents, or in casual conversation, stakeholders need to be clear about which specific policies are mandated versus those that are voluntary, and what the processes for any TDM initiative will entail. The Land Development Review process presents the most affirmative opportunity to specify these requirements, and it is within these documents that specific actions must be identified as mandatory ("Shall" do) or optional ("May" do).

While mandates can be a useful tool for ensuring compliance with TDM policies, prescriptive language regarding activities, timetables etc. can stymie private sector resourcefulness, foster an adversarial public-private relationship, or discourage development altogether.[74] This reaction from stakeholders can be even more pronounced if a perceived lack of need for TDM strategies exists within this community. Accordingly, municipal officials must take efforts to clearly outline the

[74] Nygaard, Traffic Reduction Strategies Study.

existing transportation concerns and the anticipated benefits associated with TDM reforms.

It is also important that stakeholders understand that they are being treated fairly—both in accordance with local ordinances, as well as relative to other stakeholders. Perceptions by developers or businesses of inconsistent application of TDM policies can facilitate mistrust and a lack of cooperation within the private sector. Accordingly, it is paramount that the City works closely with these stakeholders to develop a comprehensive TDM program that is amenable to all parties' interests and capabilities. In other words, South Burlington policymakers must take specific steps to facilitate stakeholder and municipal buy-in.

5.2 Stakeholder Buy-in

The success of a TDM program is determined primarily by the degree of integration at the community level. Because TDM seeks to change individual commuter behavior, and relies, to a large extent, on employers and developers as partners in this effort, a high participation level is integral. Anticipating that most of South Burlington's TDM policies will rely on voluntary, rather than mandatory measures, achieving willing participation from the private sector will be especially important.

Expressing TDM policies and goals clearly and consistently are requisite steps in this endeavor to facilitate buy-in, but only a first step. The expectations expressed through these TDM goals and mechanisms must be pragmatic and feasible. Unrealistic expectations can impair morale and confidence on both sides of the public-private partnership and derail cooperation before it effectively begins. Therefore, it is incumbent on City officials to work with stakeholders in all stages of the TDM program development process to ensure that objectives are properly balanced with the resources of stakeholders, and that ultimately, the goals established are, in fact, attainable.

Through discussions with these stakeholders, City officials can ascertain which policies may generate the most buy-in, and which are likely to face opposition. One recent study commissioned by the City of South Burlington identified a perceived lack of parking as a factor that may detract from the appeal of office use in the City Center.[75] Insight into preferences and perceptions such as this can help

[75] Allen & Brooks. "South Burlington Market Study Report." Prepared for the City of South Burlington. May 30, 2012.

policymakers design a program that mitigates these concerns and maximizes private sector buy-in. Based on that study, it is evident that any TDM program instituted by South Burlington must be especially sensitive to the issue of parking in the City Center.

5.3 Management

A final and significant consideration is that of Program Management. The administrative requirements and financial costs associated with designing and implementing a comprehensive TDM program are vitally important to the long-term sustainability of a TDM program. It is helpful to assess the two components of Program Management—Program Design and Program Implementation—independently.

Municipal government is best suited to lead the effort of TDM Program Design. Given the City's access and authority over zoning ordinances and development projects, their regular and direct interaction with developers and businesses, and their role as the local transportation authority, the City is well positioned to guide the development of a program in a way that balances the various interests of the community that it serves without undermining efforts to attract new business and development.

The major elements that the City must consider in designing a comprehensive TDM program include: *The City's specific TDM goals; The level of administrative involvement* (including which entities will be responsible for administration and enforcement)*; The financing options available; What data will be used to establish baselines, and then used to monitor and evaluate program effectiveness;* and finally, *a Fiscal Year 1 Work Plan and budget*, which lays the groundwork for the program's initiation. [76]

Program elements, such as the assessment of Impact Fees and offsets, or conditions of Development Agreements (should they be included) are also best determined by the City, based on municipal budgetary and development projections. It should be noted that determining a reasonable and effective dollar amount required to cover the costs of needed facilities can be especially challenging,[77] and these program elements are likely to be subject to revisions over time.

[76] National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. 13.
[77] Ibid.

The data component of a TDM program, including monitoring and evaluation, presents the most significant potential administrative challenge to the City. The first priority is that the data must be credible and of value to the stakeholders who will be subject to these accounting measures. This necessitates not only that the information being collected is relevant to the TDM efforts, but also that the way that information is collected is both accurate and consistent. In light of this, and in reaffirmation of the section above, it is crucial that the City work closely with the CCRPC and stakeholders to ensure that whatever metrics are employed to gauge TDM program effectiveness and compliance are recognized as credible by all parties.

While it is incumbent upon the City to lead the effort to design a comprehensive TDM program, Program Implementation, including monitoring and evaluation, requires a more significant and ongoing investment of resources. Accordingly, it is reasonable for the City to consider working with a third-party entity to manage certain components of the TDM program once it has been created. In fact, City officials have voiced support for the consideration of using a third-party entity to administer certain program elements, stemming from uncertainties over the long-term allocation of constrained municipal resources.

This third-party program manager role may be assumed by a TMA, an entity which retains the experience and technical expertise to effectively manage the program. Alternatively, a private firm, such as a Parking Management Agency, may assume this role. Ultimately, a thorough and long-term assessment of the City's budgetary and logistical resources should inform which entity is best suited to manage South Burlington's TDM program once developed. If the City does opt to employ a third-party TDM program manager, statute dictates that the authority to do so must be granted by the South Burlington City Council.

6 RECOMMENDATIONS

The strategies addressed above reflect TDM Best Practices based on observations in communities around the nation. Ultimately, South Burlington will likely pursue some mix of the elements above, based on the specific needs and preferences identified by the community. In order to determine the specific elements for South Burlington's TDM program, policymakers must first engage in a process of visioning and assessment, where goals and resources are identified. With this foundation in place, specific program elements can be conceived and pursued.

In many respects, this process is the most important component of a comprehensive TDM program in South Burlington. Even an optimal strategy (or set of strategies) can fail if it is not properly planned, executed and monitored. Moreover, community buy-in hinges on perceived value, for which some program evaluation is required.

The following section begins with an overview of the process through which the City of South Burlington is recommended to develop a comprehensive TDM program.

Specific policy recommendations, many of which have been embedded throughout this report, have been consolidated for clarity and presented in the proceeding section as well. The Recommendations section concludes with a discussion of additional programs and policies that South Burlington may wish to consider, and which were not discussed earlier in this report.

6.1 The Process:

For South Burlington policymakers tasked with developing a TDM program, it is recommended that the following process is employed to guide the development of the program elements and policies. This will help to ensure that the TDM program is adequately planned, implemented and refined as necessary, in furtherance of the program's long-term efficacy.

Ultimately, a reliably sound process can be amended to changing circumstances, resources, preferences, goals and feedback. This protocol offered below affords a great deal of flexibility to policymakers looking to integrate TDM strategies within the community. Moreover, it promotes long-term stability, efficiency and effectiveness, while ensuring that the goals and objectives are practical and representative of the community's interests.

The following process for creating a comprehensive TDM program is also endorsed by the CCRPC:

1. *ID stakeholders and engage*
2. *Define problems, priorities and goals*
3. *Evaluate solutions—Feasibility test*
4. *Implementation (includes securing funds)*
5. *Monitoring/Evaluation*

A TDM program formulated without these guiding facets is likely to be programmatically deficient, unsustainable, and/or difficult to measure reliable outcomes for. Each of these elements has been elaborated upon below.

1. *Identify & Engage Stakeholders*

South Burlington Municipal staff must actively engage stakeholders in order to ascertain the specific needs, preferences, concerns, interest level, and resources available within the community regarding TDM policies.

City Staff are encouraged to convene regular (i.e. quarterly) meetings with developers, employers, business associations, and the general public, inviting them to participate in the development of a community-wide TDM program. These meetings should be structured such that each of the necessary program elements are addressed and developed accordingly, including specific goals, incentives, disincentives, and timelines. Moreover, the CCRPC recommends that this outreach to stakeholders include an outline of planning efforts to date, the solicitation of preferences on priority services, the identification of optimal operating entities, and funding sources.

New developments and worksites present especially enticing opportunities for TDM engagement by City staff. Typically, new development proposals include mitigation measures, which the CCRPC points out, "Could logically include TDM measures as conditions to secure permits."[78] Moreover, employers and building design both significantly influence commuter behavior at a given site. Influencing commuter behavior towards utilizing alternative transport modes is more effective when TDM program intervention occurs before driving alone to work is habituated.

City staff may also consider conducting a community-wide survey to capture the input of the broader community, including those who may not be able to attend public meetings. Information garnered from such polling can also be useful in establishing baseline data prior to program implementation.

Stakeholder engagement should initiate at the inception of this TDM program development, and should be ongoing throughout the life of the program to ensure that it continues to meet the desired objectives and community needs.

[78] URS. TDM Regulatory Conditions: Barriers and Recommendations.

2. *Define Problems, Priorities and Goals*

Through the process of stakeholder engagement, the existing problems, priorities and desired goals should become evident. While the feedback generated from engagement may reflect a variety of interests of varying magnitude, it is imperative that City staff consolidates these preferences into clear, concise, and attainable goals.

A lack of a "real" defined problem based on stakeholder consensus has been identified as perhaps the greatest pitfall for TDM professionals.[79] Potential TDM goals may be general in nature, such as:

- Improve mobility options,
- Shift travel demand to off-peak times or alternative routes,
- Enhance regional travel options,
- Improve business climate,
- Improve community awareness of various transportation options.

Or they may include specific targets, such as:

- Reduce vehicle miles traveled or peak-period congestion by 15%,
- Maintain current Level of Service (LOS) on all community streets
- Shift 5% of all trips to alternative modes over the next 10 years.

It is recommended that the goals established for the TDM program track both traditional transportation measures of success and more broad-based economic and quality-of-life indicators. As the Victoria Transportation Policy Institute notes, "This approach recognizes that the quality of a transportation network is not only defined by its ability to move people from point to point, but also by its ability to support wider community goals." [80]

Once goals and priorities are established through consultation with stakeholders, it is recommended that program elements are clarified, including: funding, geographic scale, institutional framework and operating entities. A timeframe for implementation must also be determined, as well as the criteria through which the program's effectiveness can be measured.

[79] VTPI. TDM Encyclopedia. 54
[80] VTPI. TDM Encyclopedia. 61

3. *Evaluate Solutions (Feasibility Check)*

The TDM strategies outlined in this report represent national best practices, and should provide a reasonable starting point for South Burlington policymakers as they evaluate the TDM options available to them. In order for policymakers to ensure that their TDM program is practical and the goals are attainable, each policy should be carefully scrutinized within the context specific to the South Burlington community. Ultimately, **it is recommended that each of the policies considered must be subject to the following evaluation, or "feasibility check":**

- Political:
  - Are the TDM programs and services politically feasible?
  - Will all necessary partners buy-in?
  - Will commuters, employers and other markets accept it?
- Financial:
  - What funds are available?
  - What creative funding solutions can we come up with?
  - Is this funding sustainable?
- Administrative:
  - Are tools and resources available for this project?
  - Who will manage this program?
  - Are resources available for the necessary evaluation and reporting of accomplishments?
- Realistic:
  - Are the program goals realistic in the time I have to accomplish them?[81]

4. *Implementation*

Once the goals have been outlined, and the specific policies determined, the next step in the process of TDM integration is determining how the program is to be implemented, and by which entities. This includes the critical step of securing funding sources.

A vital component of this implementation phase includes formally assigning the management and oversight duties of the TDM program to a key staff or organization. Without the existence of a point-person to take some ownership over the TDM program, it may become increasingly difficult to leverage the requisite time and attention towards sustaining the program, and may ultimately prove unsustainable.

[81] VTPI. TDM Encyclopedia. 49

The City may determine that it does not have sufficient resources to manage the program solely within municipal offices. While it is incumbent on the City to assign a TDM program manager, the bulk of the duties may be assumed by an alternative entity, such as a TMA, employers, or neighborhood associations, for example. Whatever the arrangement, **the City must clearly delineate implementation responsibilities to the relevant parties.**

5. *Monitoring/Evaluation*

The final phase of TDM program facilitation is monitoring and evaluation. This process necessarily starts with the collection of baseline data. Some information, such as road congestion, may already be available to City staff. Other information, such as specific commuter behavior, may need to be newly measured. Surveys provide a useful means of acquiring such data, and may also be used to supplement existing data sets. Baseline data should include both qualitative and quantitative data from various sectors of the community.

Once policymakers have an appreciation for the existing levels of service, transportation concerns, and community interest in TDM, specific milestones can be set. These milestones will indicate relative progress, and represent the desired outcomes from a comprehensive TDM program. Building TDM Milestones into a community TDM program also creates an environment where strategies are constantly measured and evaluated for effectiveness. This, in turn, fosters an opportunity to revise priorities and adapt and modify programs as needed.[82]

The tools used to generate baseline data can generally be employed as evaluation tools, as well. Surveys, for example, can be re-done in regular intervals and used to gauge changes over time in commuter behavior and TDM awareness. Standardized and consistent evaluation tools are especially useful because they provide directly comparable data. Other evaluation tools include focus groups, demographic data gathering, and stakeholder-interviews.

Whatever evaluation tools are to be utilized by the City, it is important that program managers are aware of how commuter behavior is modified based on elements of the TDM program. One important consideration to keep in mind is that, "The effectiveness of TDM strategies are not mutually exclusive and are not cumulative. In that, it is difficult to separate the effectiveness of individual strategies that are

[82] VTPI. TDM Encyclopedia. 62

implemented together as a package."[83] Efforts should be taken to parse out the impacts of specific strategies, but overall program efficacy will be easier to gauge.

Ultimately, without some measure of program effectiveness and impact, there will be no basis for continuing a TDM program in South Burlington. **Accordingly, monitoring and evaluation criteria must be a core component of the City's TDM program.**

6.2 Programs and Policies

The process described above should form the foundation of any TDM program adopted by South Burlington. Through that process, South Burlington policymakers are encouraged to assess the feasibility and potential value of the strategies outlined in this report, which represent the national best practices for TDM programs. Based on that assessment, a suite of preferred strategies should take form, initiating South Burlington's comprehensive TDM program.

The following recommendations have been extracted from the Report and consolidated below. These recommendations reflect the policies assessed to be the most relevant and potentially useful to South Burlington. However, any strategy considered by South Burlington staff—including those below—should be subjected to rigorous analysis via the process outlined above.

- **It is recommended that the City immediately initiate the Process described above, beginning with Stakeholder engagement.**

- **It is recommended that the City review the value of the existing Overlay District, and consider revisions to this tool in the context of TDM goals.**

- **It is recommended that the Comprehensive Plan and the Form-Based Codes be amended to include language specifying TDM goals, and to encourage TDM integration by developers and City agencies.**

- **It is recommended that TDM be incorporated into all stages of the Land Development Process, making it integral to the process, rather than ancillary.**

[83] VTPI. TDM Encyclopedia. 60

- **It is recommended that the City consider revisions to shared-parking policies, including streamlining the process for formalizing and altering agreements.**

- **It is recommended that the City consider the use of Impact Fees to fund TDM initiatives. Alternatively, the City can approve TDM measures as legitimate Impact Offsets.**

- **It is recommended that the City assume a cooperative, guiding role in assisting stakeholders with TDM integration. This includes sustaining and building upon a cooperative professional relationship with CATMA in order to maximize the TDM resources afforded to the community.**

- **It is recommended that any mandate adopted by the City be complemented with incentive structures that provide net benefits to each stakeholder.**

- **It is recommended that the City consider mandating TMA membership or the adoption of TDM strategies for large developments and/or employers.**

- **It is recommended that the City explore opportunities to contract an independent organization to manage and broker parking within South Burlington.**

6.3 Additional Policies for Consideration

A number of additional policies are also pertinent to South Burlington, and warrant review by policymakers. These strategies are briefly described below.

1. *Pre-Permitting Districts*

   Based on conversations with City staff, the concept of Pre-Permitting Districts has some traction among policymakers, and presents a unique opportunity to incorporate TDM strategies into new developments.

   In this application, a Pre-Permitting District is envisioned as a development in which certain design elements, including TDM measures, are incorporated into the plans by Municipal staff prior to any development agreement. The incentive for developers, who would be required to abide by these design standards, is that the development will have the necessary permits up front, greatly streamlining the development process, while adding a level of certainty to it as well. In this policy the TDM

elements are built into the development design, and will continue to provide benefits throughout the life of the project.

Therefore, it is recommended that South Burlington consider developing a TDM-based Pre-Permitting District under a pilot program initiative. This will allow policymakers to evaluate the efficacy of this strategy prior to consideration for a more broad application.

2. *Parking Trade-Offs*

The LDR reforms discussed earlier in this report reflect best practices nationwide. However, the CCRPC also points to another tool available to Vermont municipalities which, to date, has not been widely employed.

Under the State's enabling legislation for zoning, V.S.A. Title 24 Part 2, Chapter 81, Section 4407 (4), municipalities are authorized to allow trade-offs of required parking spaces for employee use of public transit services. This policy serves TDM goals in a similar fashion as other parking management strategies discussed in this report, such as reduced minimums and unbundled parking.

Therefore, it is recommended that the City consider employing the V.S.A. Title 24 Part 2, Chapter 81, Section 4407 (4) statute to achieve TDM goals.

3. *Mandatory TDM Program for Employers*

Mandatory TDM programs for worksites are often the most effective means of generating TDM benefits, but are also likely to face substantial resistance from employers. Accordingly, **it is recommended that any mandates are limited, phased-in gradually, and not bolstered by sanctions in the short-run.**

Employment centers with large numbers of employees represent the greatest opportunity to realize TDM goals, and should be the focus of any mandatory TDM requirements. Such mandates may include specific TDM programs (or a suite of programs from which to choose specific measures) which organizations are required to utilize. Alternatively, large employers can be mandated to join a TMA, which can assist in the development and implementation of a worksite TDM program. Both policies have been very successful in a number of municipalities nationwide, and warrant consideration by policymakers.

It is recommended that South Burlington consider adopting a mandate requiring businesses of a certain size (i.e. 100+ employees) to adopt certain TDM measures and/or join a TMA to do so on their behalf. This policy should be phased in over a number of years, gradually expanding to additional businesses in the City.

4. *Commuter Club Program*

Another strategy worth noting is a Commuter Club Program, which has been successfully implemented in a number of communities in Colorado, in particular. Through this program, commuters become eligible for discount coupons and special prizes by staying involved in transportation alternatives. This program should be integrated as a promotional and marketing tool benefiting local businesses that provide discounts to participants. CATMA already employs a similar program (though restricted to member organizations), which could serve as a model for the City.

It is recommended that the City engage with local businesses to determine the level of support for a Commuter Club Program. Provided sufficient interest exists, the City should consider implementing it on a pilot-project scale.

5. *Publish Suite of TDM Strategies for Public*

To assist the community in developing a TDM program (and more broadly, a TDM culture), **it is recommended that the City compile a suite of TDM strategies supported by the City, to be published and posted on the City website. This list should include a comparative measure for level of impact in furtherance of TDM goals. Solicitation of community input should also be a feature of this resource.**

7 CONCLUSION

The City of South Burlington faces an opportunity to implement creative solutions to traffic congestion and parking issues, especially in preparation for the development of the City Center/TIF District. A broad array of Transportation Demand Management strategies exist, and provide City staff with suite of policy options for attaining TDM goals. Ultimately, the preferred set of policies will be determined by the stakeholders

(namely businesses and developers in coordination with the City), based on the goals, preferences and needs of the community.

In developing this program, however, a few key points must be acknowledged. First, is that any disincentives must be complemented with incentives. The efficacy of a TDM program is facilitated through the generation of stakeholder buy-in, and incentives go far to this end, while disincentives can affect the opposite. Secondly, language is vitally important in a TDM program. It is imperative that stakeholders can clearly determine which actions are mandatory versus those that are voluntary, and the roles of respective entities.

Finally, it is important to note that for most of the public, Transportation Demand Management remains an obscure concept, at best. Keeping this in mind, a considerable amount of effort will be spent on outreach and educating stakeholders. Therefore, facilitating buy-in may be a slow process, and strategies to do so must be continuously reevaluated and revised as necessary. The long-term effectiveness of South Burlington's TDM program will be largely based on the level of commitment from the City, and the degree of flexibility and adaptability that is built into the structure of the program.

The City of South Burlington is well positioned to lead the evolution of a comprehensive TDM program, leading to potentially significant environmental, social and economic benefits to the community. As the development of the City Center moves forward, opportunities to expand and improve this TDM Program will increase. With proper support and investment from the City, South Burlington is effectively poised to lead Chittenden County's TDM efforts, and reap the benefits of these progressive, demand management policies.

Works Cited

Allen & Brooks. "South Burlington Market Study Report." Prepared for the City of South Burlington. May 30, 2012.

Campus Area Transportation Management Association (CATMA). "Annual Fall Employee and Student Survey (Fletcher Allen, UVM, Champlain College), 2000-2012."

Chittenden County Regional Planning Commission (CCRPC). "2013 Chittenden County Environment, Community, Opportunity, Sustainability (ECOS) Plan." June 19, 2013.

Comprehensive Development Ordinance, City of Burlington, Article 8, Sec.8.3.1. Web. May 30, 2014.

City of South Burlington. "Comprehensive Plan, 2012-2016: Strategy 55." 2-8.

City of South Burlington. "TIF District". Web. April, 1 2014.

City of South Burlington. "Welcome". Web. April, 1 2014.

Federal Highway Administration (FHWA). Office of Operations. "Travel Demand Management." April 2004. Web. April 1, 2014.

Hendricks, S.J. "Land Use & Development Regulation: TDM's Role in Making Them More Effective." Presentation for the Association of Commuter Transportation International Conference. July 30, 2013.

Montana Department of Transportation. "Montana Transportation and Land Use." Web. April 1, 2014.

National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. By K.E. Seggerman and S.J. Hendricks. October 2005. Prepared for Florida Department of Transportation (FDOT).18

Nygaard, N. Traffic Reduction Strategies Study. Prepared for the City of Pasadena. 2006. Web. April 1, 2014.

SANDAG. "Integrating Transportation Demand Management into the Land Development Process." May 2012. 5.

Schoup, D.C. "The Trouble With Minimum Parking Requirements." Transportation Research Part A, Vol. 33. December 9, 1999. 549-574.

Seattle Urban Mobility Plan. “Best Practices: Transportation Demand Management.” January 2008. 7B.

State of Maryland Governor's Office of Smart Growth. "Driving Urban Environments: Smart Growth Parking Best Practices." Prepared by Robin Zimbler. 2002.

Transportation Research Board of the National Academies. Transit Cooperative Research Program (TCRP). “Report 95: Employer and Institutional TDM Strategies.” Washington D.C. 2010. 30.

United States Bureau of Transportation Statistics (BTS). “1990 Nationwide Personal Transportation Study (NPTS).” 1990.

United States Census Bureau / American Fact Finder. “DP03 : South Burlington, VT Selected Economic Characteristics.” 2008-2012 American Community Survey (ACS). U.S. Census Bureau’s American Community Survey Office, 2012. Web. April 1, 2014.

United States Environmental Protection Agency (EPA). “Trip Reduction Ordinances.” n.d. 2.

UrbanTrans. Transportation Demand Management Toolkit. Prepared for Colorado Department of Transportation (CDOT). October 2002. 10.

URS. “Chittenden County TDM Education, Outreach and Support Program.” Briefing Paper: TDM Regulatory Conditions: Barriers and Recommendations. Prepared for Chittenden County Metropolitan Planning Organization (CCMPO). December 21, 2004; Updated February 21, 2005.

URS. “Chittenden County TDM Education, Outreach and Support Program.” Briefing Paper: Opportunities and Challenges. Prepared for Chittenden County Metropolitan Planning Organization (CCMPO). December 15, 2004; Updated February 23, 2005; Updated May 6, 2005. 3.

Victoria Transport Policy Institute (VTPI). TDM Encyclopedia. Web. April 1, 2014.

Vt. Stat. 24 V.S.A., §§5200.

ADDENDA

Effects of TDM Strategies

TDM Strategy	Automobile Trip Reduction
Financial incentives/subsidies (1997)	3-7% ($1 per day) 6-15% ($2 per day)
Parking cash-out (1997)	10-13% (worksite)
Compressed work weeks (1998)	7-10% (worksite)
Telework (1997)	1-4% (area wide)
Walking/Bicycling improvements (2000)	1-2% (area wide)
Carpooling/Vanpooling programs (1996)	1-3% (area wide)
Marketing and promotion (1996)	1-3% (with other strategies)

Source: UrbanTrans. Transportation Demand Management Toolkit. Prepared for Colorado Department of Transportation (CDOT). October 2002. 10.

TDM Strategies: Direct Consumer Impacts

Positive Incentives	Mixed	Negative Incentives
Alternative Work Schedules	Access Management	Fuel Tax Increases
Bike/Transit Integration	Carfree Planning	Parking Pricing
Carsharing	Comprehensive Market Reforms	Road Pricing
Commuter Financial Incentives	HOV Preference	Vehicle Use Restrictions
Guaranteed Ride Home	Parking Management	
Improved Security	Smart Growth	
Location Efficient Mortgages	Street Reclaiming	
New Urbanism	Traffic Calming	
Park & Ride		
Pay-As-You-Drive Insurance		
Pedestrian and Cycling Improvements		
Ridesharing		
School Trip Management		
Shuttle Services		
TDM Marketing		
Telework		
Transit Improvements		
Transit Oriented Development		

Source: Victoria Transport Policy Institute (VTPI). TDM Encyclopedia. Web. April 1, 2014.

Integrating TDM into the Land Development Process

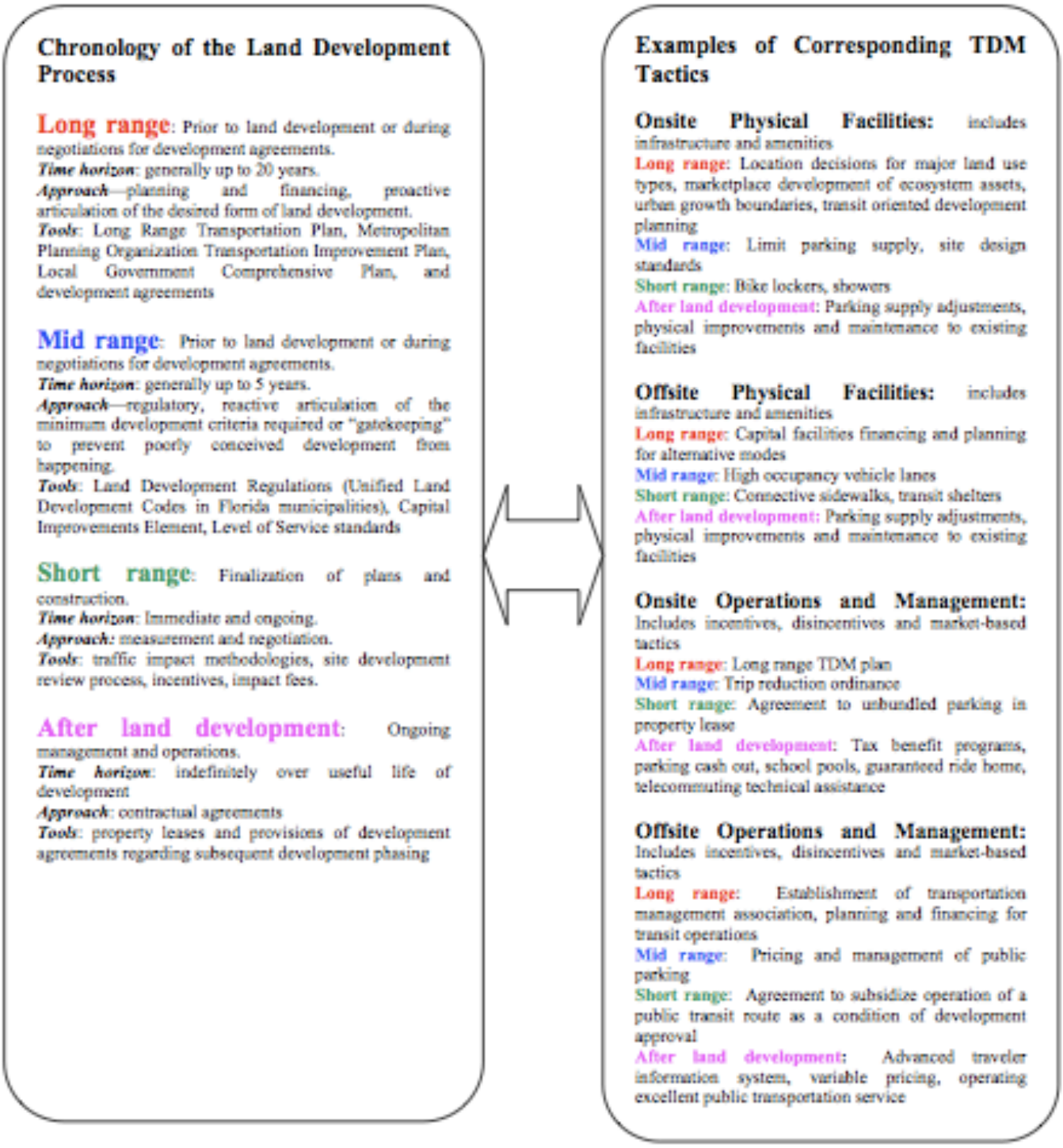


Figure 3: TDM Tactics Can Apply to All Stages of the Land Development Process

Source: National Center for Transit Research Center for Urban Transportation Research. Incorporating TDM Into the Land Development Process. By K.E. Seggerman and S.J. Hendricks. October 2005. Prepared for Florida Department of Transportation (FDOT).18

TDM Strategies Matrix

Table 1: TDM Strategies Matrix

Geography	Type of plan or measure	Implementation tool (mechanism)	TDM STRATEGIES							Performance Measures
			Land Use & Urban Design	Transit	Ridesharing	Parking Management	Pricing	Bicycle & Pedestrian	TDM programs and Program support	
Site/ Employer	• TDM Site Plans • Construction Mitigation Plans	• Transportation Management Association (TMA) • Commuter Benefit Program • Parking regulations • Identify staff or TDM coordinator • Complete Streets	• Site design that promotes and facilitates transit, walking and biking	• Provide transit facilities (such as shelters) • Subsidize transit fares • Provide transit information (maps, signage, real-time info, etc.) • Provide shuttles from transit to worksite • Support carsharing and other first and last mile measures • Allow employee use of company vehicles for personal appointments/errands	• Preferred parking for carpools and vanpools • Promote the regional ridematching service • Provide or subsidize vans and/or vanpooling • Subsidize ridesharing • Support carsharing • Allow employee use of company vehicles for personal appointments/errands	• Reduce or eliminate free parking • Include priority parking for carpools or vanpools • Limit parking spaces on site (parking maximums) • Implement Parking Cash Out • Parking reservation system (Smart Parking – pay more for priority spots) • Unbundle the price of parking	• Charge market rate for parking • Parking Cash Out	• Site design that promotes walking and/or biking • Provide showers and lockers at employment sites • Provide secure bike parking • Bicycle-sharing/loan programs	• Designate an employee transportation coordinator to promote and coordinate transit, ridesharing, walking and biking. • Implement flex hours, telework and/or compressed work week options. • Allow employees to relocate jobs to branch office nearest their homes. • Provide pre-tax benefit for employees who use transit, vanpool, or bike to work. • Promote /enhance the Guaranteed Ride Home program	• Parking and vehicle counts • Average Vehicle Ridership (AVR) • Vehicle Employee Ratio • Number of equivalent SOV trips not made/reduced • VMT reduced • Parking revenue • Transportation Management Association memberships
City	• General Plan • Specific Plans • Master Plans • Municipal TDM Plans • Climate Action Plans • Corridor Plans • Parking Management Plans • Bicycle and Pedestrian Plans • Community and neighborhood plans	• Trip reduction policies and ordinances • Parking policies and ordinances • Complete Streets (AB 1358) • Design Guidelines • Development Agreements • California Environmental Quality Act	• Urban design guidelines that promote and facilitate transit, walking, and biking • Street design that accommodates all users (transit, bike, walking, ADA) • Restricted automobile use in pedestrian oriented areas • Growth Management Boundaries	• Transit priority signaling at intersections • Transit only lanes or priority routes • Improved accessibility to transit stops (safe bike and pedestrian connections) • First mile and last mile solutions to transit • Outreach and promotion • Support the implementation of transit facilities (shelters, stations)	• Priority or preferred parking for carpools and vanpools • Carsharing • Park & Ride lots • HOV lanes • Managed lanes • SchoolPool programs	• Supportive zoning requirements - parking maximums • Shared parking between compatible land uses (office and restaurant/cinema) • Priority public parking for carpool/vanpool • Way-finding and guidance system to available parking • Demand based or performance based pricing • Restrict long-term/commuter parking to peripheral areas • Unbundle the price of parking	• Congestion pricing on roadways or areas • Variable market rate on-street parking pricing	• Plan and implement a bicycle and pedestrian network that is connected to regional and state facilities and that connects to transit • Provide ample and secure bike parking • Public awareness programs for bicyclists/ pedestrians • Bikesharing program	• Promotion and outreach to major employers and the community • Enforcement of TDM policies • Form TMAs to achieve shared goals.	• Level of service (LOS) • Mode split and mode shift • Bicycle and pedestrian counts for commute and other trips • Transit travel time reliability • Public parking demand • VMT • SOV trip reduction
Region / State	• Regional Transportation Plan and Sustainable Communities Strategy and its Urban Area Transit Strategy • Regional Comprehensive Plan • Climate Action Plan • Regional Bicycle Plan	• Growth Management • Complete Streets (AB 1358) • California Parking Cash Out Law (SB 728)Smart Growth Incentive Program • Active Transportation grant fund	• Smart Growth Tool Kit • Growth Management Boundaries	• HOV lanes/transit only lanes/transit supportive infrastructure and facilities/managed lanes • Safe Routes to Transit • Traveler information • Transit marketing programs	• Regional vanpool program • Carpool Incentive Program • Guaranteed Ride Home • Free ridematching service • Multimodal Park & Ride lots • Support carsharing programs	• Advanced traveler information systems • 2050 RTP and SCS – Technical Appendix N of the Urban Area Transit Strategy	• Provision and support of HOT lanes/Dynamic pricing of roadway facilities and managed lanes	• Plan for and implement a regional/statewide bicycle network • Public awareness programs for bicyclists and pedestrians • Provide secure bike parking at key intermodal transit centers • Bikesharing program	• iCommute services and programs • SANDAG: Regional Intermodal Transportation Management Systems (TMS) Network • Education and awareness campaigns for all modes • 511 phone and 511ad.com	• Transit and roadway LOS • LOS uniformity within a corridor or network • Transit and roadway capacity available • Transit usage • Transit and auto travel times • Mode split and mode shift • Transit travel time reliability • Regional or statewide VMT • SOV trip reduction • Non-motorized trip counts

SANDAG. "Integrating Transportation Demand Management into the Land Development Process." May 2012. 25.

The following documents have not been included in this report due to the length of these Ordinances. However, complete versions of official ordinances can be accessed via the following web addresses.

- **City of Cambridge, MA. "Trip Reduction Ordinance."** <https://library.municode.com/index.aspx?clientId=16889&stateId=21&stateName=Massachusetts&customBanner=16889.jpg&imageclass=L&cl=16889.txt>

- **City of Tukwiia, WA. Ordinance Number 2201: "Commute Trip Reduction for Employers."** <http://www.tukwilawa.gov/dcd/ctr.html>

- **King County, WA. "Commute Trip Reduction" Ordinance.** <http://www.kingcounty.gov/transportation/CommuteSolutions/About.aspx>