Multi-Mobal Mobility, A True Synergy.

VISION OF THE TOWN'S MOBILITY SYSTEM.

A basic idea is that every resident, business person and visitor in a town with character can travel anywhere in town safely, conveniently and inexpensively. At its essence, mobility is about moving people and goods, not vehicles.

Regular bus service at a multi-modal superstop.

STRATEGY.

Character towns offer full mobility to all its residents. The town's transportation strategy is to fully exploit every mode of travel for its designed purpose.

NOTIONS FOR THE SYSTEM PLAN.

Planning the transportation system for a diverse city requires two systemic notions:

1. The transportation network is a holistic system that can be optimized since the destinations and origins of the person-trips using the system, today and tomorrow, can be determined.
2. The strengths of every travel mode can be exploited to match user needs. Proper streets occupied by cars, buses, bikes and pedestrians reflect an awareness that the system's main job is to enable everyone to move about town safely, conveniently and inexpensively.

THE STRATEGIC OBJECTIVES FOR THE COMPLETE SYSTEM.

- To increase the capacity of the street network for single-occupancy vehicles [SOVs] of all types consistent with the town's vision of sound community development by recognizing that:
  - € Local streets have specific roles in neighborhoods.
  - € Collectors and arterial roadways are more concerned with moving traffic than serving local needs and can be designed to move traffic consistent with community goals.
  - € Limited access highways are specialized facilities that need to be located and designed carefully.
- To increase the capacity of all non-single occupancy vehicle modes of travel to serve a large number of person-trips with a reduced number of vehicle-trips by:
  - € Increasing the capacity of the bus and transit systems in the city.
  - € Increasing the use of "shared" programs such as ride-share, car-share, bike-share and job-share.
  - € Increasing the usefulness of bikeways and pedways as modes of travel beyond recreation.
- To decrease demand for vehicular travel by:
  - € Co-locating activities and services in a mixed-use place that fills the needs of residents, visitors, employees and shoppers.
  - € Enacting land-use programs for closer live-work lifestyles.

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INCREASE THE CAPACITY OF THE STREET NETWORK.

- **The Urban Area Transportation Planning Process.** The state and federal departments of transportation have created a system that includes cities and counties in a collaborative planning and implementation system. The "urban area transportation study" includes the cities and counties in the metropolitan urban area. The system is managed by the federal-state-local organization known as the Metropolitan Planning Organization, or MPO. The MPO manages the long-range transportation plan for the metropolitan area and also the five year spending program called the Transportation Improvement Plan [TIP]. The MPO is also responsible for the regional transit and bikeway planning programs.
- **Street and Highway Capacity Enhancements.** Enhance the capacity of streets and highways consistent with the growth of the city and the constraints of the adjacent environments since cars will always be with us, even if they are driverless. Capacity enhancement projects include building new roads and adding lanes to existing roads. Coincidently, enhancements to highway capacity can also add new travelways for transit lines, trains, buses, bikeways or pedways increasing the capacity of the entire system. The idea of "complete streets" is that all users of the street are entitled to their share of the roadway.
- **Transportation System Management [TSM] Improvements.** Operational improvements can also enhance the system's capacity. Traffic engineering activities that are site-specific or small area focused are designed to eliminate bottlenecks, correct dangerous locations and complement larger-scale capacity enhancement projects. TSM techniques include improvements to:
  - € Strategic turning lanes, dynamic striping, assigned lane changes and reversible lanes,
  - € Acceleration/deceleration lanes and ramps and weaving sections,
  - € Sharp horizontal/vertical curves, narrow lanes and shoulders,
  - € Vehicle repair and replacement detectors,
  - € Central system communication enhancements,
  - € Access management and pedestrian systems,
  - € Grade separations at critical intersections,
  - € Signal timing optimization,
  - € Controller/cabinet and signal heads,
  - € Effective signage and lighting,
  - € Pedestrian crossings w/push buttons, and
  - € Other intelligent transportation system [ITS] attributes.

It's a parking deck disguised as shops.

It's a three-level, full-block parking deck.

Like most dynamic systems, there are demand peaks and valleys. At rush hour, the demand for capacity always exceeds capacity. TSM projects and facilities can help manage this fluctuation in travel demand.

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INCREASE THE CAPACITY OF ALL NON-SINGLE OCCUPANCY VEHICLE MODES OF TRAVEL.

- **Transit Systems.** Enhance the capacity and reach of transit systems be they light rail, commuter rail, buses or trolleys.
- **Para-Transit.** Expand the availability of "para-transit" systems such as taxis, shuttles and "on-demand" transit programs to serve the general population and especially the special population including the young, the elderly, the infirmed and the impoverished.
- **Bikeways and Trails.** Bike lanes, bikeways and trails offer an urban solution to protecting bike-riders on city streets.
- **Pedways and Sidewalks** offer an easy, inexpensive and safe way to make short trips to schools, parks, restaurants and shops. Walking also offers easy exercise for children and adults.

EXTEND AND ENHANCE EACH MODE.

- **Reach.** Increasing the reach, connectivity and safety of the bikeway and sidewalk systems can improve the town's health, recreational activity and mobility. Improvement costs are usually only a fraction of roadway projects and can be provided as stand-alone facilities or part of a roadway capacity enhancement project.
- **Connections.** Connecting homes with schools, shopping districts and parks greatly enhances the quality of life and safety in a neighborhood by reducing vehicle trips without reducing person trips.
- **Safety.** Buses, trains, bikeways and sidewalks are safer than SOV travel. http://www.pedbikeinfo.org/index.cfm]

Commuter rail.

In-town free shuttle.

Bike-share, ready to go.

School and regular bus service.

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DECREASE TRIP DEMAND.

Reducing per capita and total vehicle trips is important. While many of us prefer the option of driving ourselves around, it is expensive. Congestion and vehicle costs are staggering. Even with the momentary reduction in gas prices, it is incredibly expensive for people to buy, use, insure and maintain a single-occupancy vehicle [SOV], especially when you add in the costs of tolls and parking. The need for families to have two or more cars exacerbates the problem. The idea behind managing the demand for travel is to use various public policies and non-SOV options to reduce the demand for SOV travel without compromising people's mobility and their lifestyle.

Demand-side reductions for vehicular travel, in real and relative terms, have proven modestly effective in improving city traveler mobility; and these programs can actually be accomplished in a small area by a single entity without involving the regional system. They are:

- **Mixed-use development.** Locating activities and uses closer together by designing mixed use and multi-use places where residences, shopping, schools, parks and job sites are proximate. This improves the effectiveness of transit service. Land development code revisions may be required.
- **Bikeways and pedways.** Increase the short-trip system by improving pedestrian and bike systems. Safe bikeways can also accommodate longer distance commutes.
- **Transportation demand management [TDM]** is a specific area of transportation planning's practice that produces results.

Transportation Demand Management

"TDM is a set of measures, including legally mandated programs, that was developed to provide solutions to problems of increasing highway congestion by reducing the volume of [vehicular] travel rather than by traditional approaches that focus mostly on increasing the supply side – highways and parking capacities. TDM encompasses a broad and diverse set of activities, such as limitations on parking supply and encouraging of taxi, ride-sharing, legal and business-sponsored inducement of increased average car occupancy for employees and visitors, so-called Employer Trip Reduction [ETR] programs, telecommuting, and, in the long run, land use developments that reduce the need for vehicle trips or their excessive lengths. Several of these measures, especially, car-use pricing and parking-control measures, are effective".

***Source: Transportation for Livable Cities,* Vukan R. Vuchic, Center for Urban Policy Research, Rutgers, 1999.**

Employee Vehicle Trip Reduction Impact of Selected Employer-Based TDM Strategies

• Parking Charges	Previously Free Parking	20-30%
• Information Alone	Information on Available SOV Alternatives	1.4%
• Services Alone	Ridematching, Shuttles, Guaranteed Ride Home	8.50%
• Monetary Incentives Alone	Subsidies for carpool, vanpool, transit	8-18%
• **Services + Monetary Incentives**	**Transit Vouchers and Guaranteed Ride Home**	**24.50%**
• Cash Out	Cash offered in lieu of accepting free parking	17%

Source: Seattle Urban Mobility Plan, *January 2008 b*ased on research conducted by Washington State DOT.

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Categories of TDM Strategies

Methods and measures used to manage transportation demand are:

- Biking and walking,
- Commute trip reduction acts (CTR),
- Growth and transportation efficiency centers (GTEC),
- Improved transportation options,
- Incentives to use alternative modes and reduce driving,
- Increased densities in transit corridors,
- Land use management,
- Mixed-use development,
- Parking cash-out programs,
- Parking management,
- Policy and institutional reforms,
- Priority parking for carpools, vanpools and short-term parkers,
- Road and parking pricing,
- Road space allocation (bike lanes, transit-only lanes),
- Telework and flexible work schedules,
- Transit and ridesharing, and
- Universal transit passes.

Source: Seattle Urban Mobility Plan, *January 2008 b*ased on research conducted by Washington State Department of Transportation.

Amtrak.

Lanes for car, bikes and pedestrians.

Bikes at the commuter train station.

Bikes at the park.

ACTIONS TO IMPROVE NON-SINGLE-OCCUPANCY VEHICLE TRAVEL.

- **Increase transit availability and usage** to and from downtowns and employment centers with commuter rail, regular bus service, bus rapid transit [BRT] systems and other transit options using:
  - € Employer incentives for employee transit ridership to reduce employee commuting costs,
  - € Employee incentives to increase transit ridership with transit ridership subsidy programs,
  - € Reduced employer provided on-site "free" parking,
  - € Back-up systems like "guaranteed ride home" to cover emergency travel for transit riders,
  - € Transit amenitization of the stations,
  - € Safe and convenient connections of work sites to nearby residential areas and
  - € Transit stations/stops with enhanced bike, pedestrian and shuttle services with on-site bike repair facilities, showers and lockers for bikers, ubiquitous umbrella availability, and covered bike and motor cycle parking.
- **Increase on-site and near site mobility** to discourage short SOV trips that could be better made with safe and convenient bike trips, pedestrian trips and shuttle trips augmented with "share" systems including bike-share and car-share systems.
- **Employ information systems** that inform people travelling to and from work of traffic conditions, transit travel options with station locations and schedules, "share" options for car-share, bike-share, ride-share and traveler wayfinding information.
- **Construct a holistic TDM system** using a combination of approaches to have the biggest impact on trip reduction [see the tables with the two Seattle Study results]. The great advantage of the TDM approach is that it is something that can be done. It can be done individually by household, unilaterally by organizations and businesses or bi-laterally between employers and creative mobility service providers. It can be done without engaging the vast machinery of the urban area transportation agencies; and it can be done relatively inexpensively.
- **Develop strategic on-site parking policies,** such as:
  - € On-site parking pricing policies that discourage the use of personal vehicles.
  - € Preferred locations for car-pool and car-share spaces.
  - € Coordination between private and public parking resources.
- **Offer a wide variety of flexible off-site work opportunities** with locations and hours that enable employees to fulfill their assigned tasks without being "on site" by:
  - € Providing generous home occupation laws by local governments enabling small businesses to operate at home,
  - € Enabling telecommuting to reduce the need for some employees to travel to the job site every work day,
  - € Encouraging job sharing as an employer-option for staffing selected functions, and
  - € Arranging work schedules for longer, but fewer days for employees to reduce travel time and costs.
- **Locate employment sites closer to residential areas.** Adopt comprehensive plans and land development codes that bring employee work sites and residences closer together.

CONCLUSIONS.

There are many small and big steps to take that increase mobility while reducing dependence on the single-occupancy vehicles.

1. **Use proven ideas.** Study the experience of other communities that have reduced vehicle trips, vehicle miles traveled and traffic fatalities to determine their methods.
2. **Promote in-town housing.** Continue to promote residential development in and near downtowns.
3. **Locate housing near employment centers.** Over time, locate employment sites closer to residential areas and locate residential areas closer to work sites.
4. **Provide short-trip non-SOV options.** Increase mobility mode options for short trips with an enhanced pedestrian system, a bike trail system, a bike-share system, a car-share system and shuttles.
5. **Expand and publicize the benefits of TDM programs to employers,** including:
   - Less stress and reduced costs of fuel and vehicle wear and tear for employees.
   - Reduced congestion that diminished the environmental damage caused by SOVs.
   - Increased partnerships between employers and local transportation providers that decrease commuting costs and increase reliability.
   - Better reliability and access to and from work with improved system dependability and choice of travel modes that lets businesses and employees better control their travel times and paths.
   - Less costs for employers with reduced work site parking that provides:
     - € More flexibility for employers to manage their on-site parking systems, and
     - € Better and more productive utilization of land now devoted to privately and publicly owned parking lots and decks.
6. **Publicize benefits of TDM programs to the general public,** including:
   - Reduced congestion on neighborhood street system,
   - Reduced community carbon footprint,
   - Increased personal health due to increased walking and biking,
   - Reduced cost of travel demand to, from and around neighborhoods for shopping, school and recreation sites, and
   - Increased community and business “brand” value based on responsible transportation management.
7. **Consider transportation as a utility.** Think of the town’s mobility system as a utility based on service provision rather than facility provision will be useful.
8. **Learn to exploit “Big Data”.** It has pluses and minuses that need to be recognized and incorporated into all transportation systems planning programs.
9. **Get ready for change.** Driverless cars are coming. Uber or Uber-like services are either here, or on the way. The implications for delivery, parking and general mobility will change conventional thinking about streets, highways and parking.