

TRANSPORTATION AND COMMUNICATION NETWORKS: Connecting People, Places, and Ideas

The interdependence of transportation and land use

No land use plan can be successful without a complementary transportation plan, because even the most forward-thinking land use policies will fail if they are not supported by transportation infrastructure and services that support their objectives. As the Wedges and Corridors Plan recognized more than half a century ago:

“An efficient system of transportation must include rapid transit designed to meet a major part of the critical rush-hour need. Without rapid transit, highways and parking garages will consume the downtown areas; the advantages of central locations will decrease; the city will become fragmented and unworkable. The mental frustrations of congested highway travel will take its toll, not to mention the extra costs of second cars and soaring insurance rates. In Los Angeles, where an automobile dominated transportation system reigns supreme, there is still a commuter problem even though approximately two-thirds of the downtown section is given over to streets and parking and loading facilities. There is no future in permitting the Regional District to drift into such a ‘solution.’”

Despite this prescient warning, we remain heavily dependent on automobiles, with more than two-thirds of workers in the county driving alone to and from work. Montgomery County communities outside the Beltway have low percentages of commuters who walk, pedal, roll, or ride transit, and our transportation system is currently a major contributor to greenhouse gas emissions.



District of Columbia
Arlington County
Montgomery County - Inside Beltway
Alexandria City
Montgomery County

Thrive Montgomery’s 2050’s focus on compact growth and infill – along with the limited availability of land for expanding rights-of-way – makes it essential that ~~over the nearly 30 years of the plan we decisively reject the impulse to ensure that driving remains as easy and convenient as possible in favor of work to make~~ walking, rolling, bicycling, and transit the most practical, safe and attractive ways of getting from one place to another. Cars – even cars equipped with autonomous driving technology - require much more space per passenger than buses and

Commented [A1]: Transportation and communications should be separate subsections in this chapter.

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Commented [A2]: How does this compare to other counties in the region/state? The whole of MOCO is not comparable to DC and some NV areas. It would be better to compare areas of MOCO inside the beltway to these other areas.

Commented [A3]: This table needs a title – is it percentage using cars or percentage not using cars?

Commented [A4]: The introduction to this plan notes the need to plan for innovations like autonomous driving and micro transit – that’s in conflict with this sentence.

trains, and walking, rolling, and bicycling are the most spatially efficient forms of travel of all. Market preferences have shifted dramatically in recent decades to favor locations with transit, bike and pedestrian access over places oriented around automobile travel, and the importance of reduced reliance on driving to meet our greenhouse gas emissions goals is obvious. However, we must keep in mind the importance of roads for the delivery of goods and services, including police, fire, and emergency services, as well as the fact that until other forms of transit are more fully developed, adequate roads are necessary. In addition, roads in Montgomery County serve as evacuation routes during natural disasters and national security events, including Continuity of Government plans.

Just as importantly, the addition of highways, travel lanes and grade-separated interchanges may help to relieve congestion in the short term, but Particular characteristics of roads - new highways, wide roads, and high-speed access ramps - are fundamentally at odds with efforts to design neighborhoods and districts to encourage human interaction and foster a sense of place. This makes it imperative to embrace the long-term economic, environmental, and social benefits of walkable, bikeable, and transit-oriented neighborhoods and districts and avoid undercutting our land use goals with auto-dominated road design and transportation infrastructure.



What is the problem we are trying to solve? Successive generations of investment in automobility have created a vicious cycle

Our dependence on driving is rooted in part in generations of efforts to facilitate the movement of as many automobiles as quickly as possible while funneling traffic to a handful of north-south arterial roadways that tie otherwise disconnected subdivisions to job and retail centers. Successive widenings to these roads have added more and more lanes for vehicles at the expense of space for pedestrians, bicycles, dedicated lanes for transit vehicles, street trees and anything else that might slow cars. This makes alternatives to driving less practical and appealing, which leads to more driving and in turn generates demand for wider roads.

Reinforcing this vicious cycle is the fact that optimizing major arterials for cars has made these corridors unattractive and unsafe, discouraging private investment and compact, transit-oriented development even where high-quality transit infrastructure is already in place (as evidenced by several large, underutilized properties along corridors near Metrorail stations).

Excessive dependence on cars threatens safety, erodes quality of life and reduces resilience

Commented [A5]: Overstates the case for a preference for urban living. We have not yet seen the effect of pandemic on preferences for living locations, urban vs suburban with recent research showing a shift to suburban from urban.

Commented [A6]: Evidence? What about for lower income workers and families?

Commented [A7]: Also to move goods from one place to another and deliver services like police and fire protection and mail delivery

Commented [A8]: What support is there for the idea that unattractive roads limits investment in development?

The most obviously and acutely damaging consequence of this dynamic is that pedestrians, bicyclists, and drivers are killed or seriously injured with disturbing frequency. Somewhat more subtle, ~~but perhaps just as significant,~~ is the effect that automobile-oriented design has on the vitality and appeal of neighborhoods and commercial districts alike. Safe, attractive streets encourage people to get out and walk, pedal, or roll, whether simply to get some exercise, to run an errand, to go to work or school, or to reach an intermediate destination such as a bus stop or rail station. This kind of activity can support physical and mental health and facilitate the casual social interaction that builds a sense of place and community. ~~Ugly, unsafe roadways are~~ Some roadways can be barriers that degrade the quality of life of everyone who lives and works near them, even if they are never involved in a traffic collision, ~~and even if they do not personally enjoy walking, rolling or bicycling.~~

Although Montgomery County's investment in transit has contributed to a slight decline in vehicle miles travelled (VMT) per capita, ~~overall VMT has continued increasing,~~ which has a huge impact on the county's efforts to reduce its greenhouse gas emissions. In 2018, 42 percent of the County's greenhouse gas (GHG) emissions were generated by the transportation sector (on-road transportation, aviation, rail, and off-road vehicles). Motor vehicles accounted for 36 percent of emissions in 2018. Private cars accounted for approximately 75 percent of all trips taken in the county followed by buses at 10 percent, rail with 5 percent, walking at 2 percent, taxi/ride hailing services (such as Uber and Lyft) with 1 percent, and biking at less than 1 percent. ~~Without a significant intervention~~ the current pattern will continue to increase our transportation-related greenhouse gas emissions and other forms of pollution.

~~The 1964 hub-and-spoke model of arterial corridors radiating from Washington D.C. The radial pattern of automobile-centric corridors,~~ limited infrastructure to support alternatives to driving, and the absence of street grid connections also make our transportation network less adaptable and resilient. ~~The radial pattern of road corridors. The hub-and-spoke model of arterial corridors~~ was a logical way to link suburban enclaves to jobs in and around the District of Columbia, but other important centers of activity have emerged since then. Our prosperity depends on access to Frederick, Prince George's, Howard, and Baltimore as well as Arlington, Fairfax, and Loudoun. The lack of efficient transit connections to schools, businesses, laboratories, and other important centers of economic, intellectual, and social activity in these jurisdictions leaves us unable to take full advantage of our presence in one of the most dynamic regions in the country, if not the world. In addition to the existing Metrorail and MARC services to the District of Columbia, master plans call for new transitway connections to Prince George's County (the Purple Line and University Boulevard BRT) and the District of Columbia (the New Hampshire Avenue BRT). However, there is a growing need to provide transitway connections to Howard and Frederick Counties, and to Northern Virginia as well.

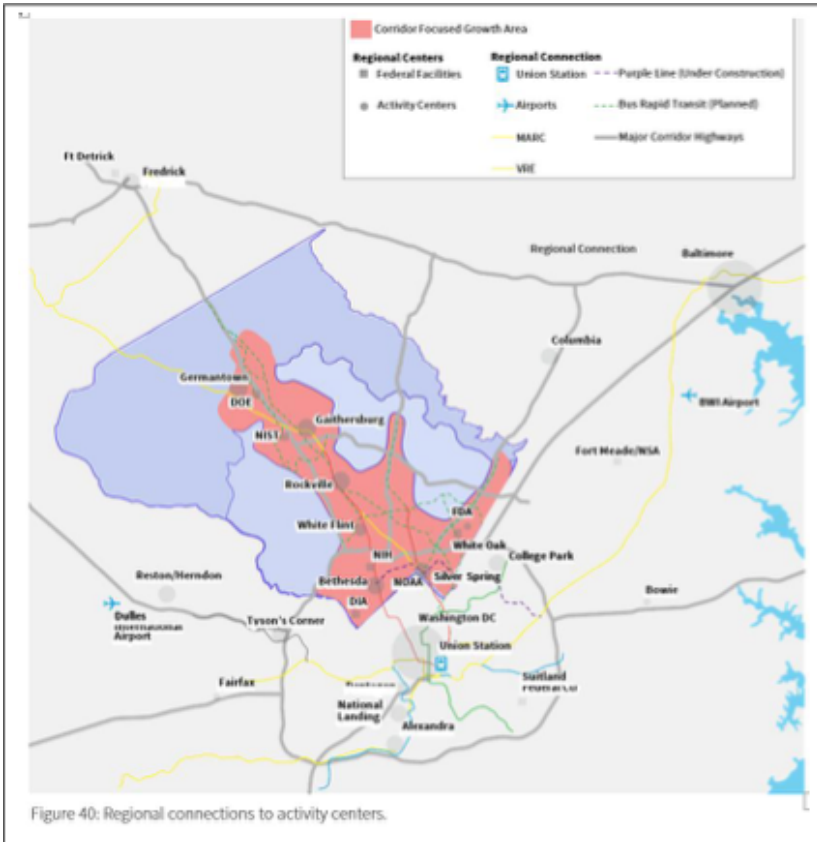
Commented [A9]:

Commented [A10]: Is this because the population is increasing? More people are driving to jobs? Clarify if this is a result of population increase. It looks from the math if per capita is going down but overall is going up it must be more people.

Commented [A11]: Multiple significant interventions and new technologies are needed and this plan should spell out details.

Commented [A12]: COG data, "Overall commute patterns from the MWCOG model", should be reviewed as the data does not necessarily support this statement.

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Even for travel within Montgomery County, our legacy road network has serious shortcomings. Our central business districts and major suburban corridors generally lack the grid of streets that create the building blocks of a thriving community, with frequent intersections and narrower vehicle lanes to facilitate slower speeds and safer crossings to make walking, rolling and bicycling more practical and attractive and to provide access points and routing options for automobiles. More and more residents and workers prefer transit and other alternatives to driving alone – and a significant number do not have access to a car – but most jobs in the county are not located near high-quality transit, and many of our neighborhoods lack even sidewalks. Combined with the absence of efficient east-west connections, especially for transit riders, this pattern limits access to jobs and opportunity, particularly for low-income residents who are more likely to depend on transit, and makes our transportation system less adaptable and resilient.

Commented [A14]: Planning doesn't use this term any longer. See <https://montgomeryplanning.org/planning/communities/downcounty/silver-spring/silver-spring-downtown-plan/silver-spring-downtown-and-adjacent-communities-plan-boundary/>

Commented [A15]: Not clear if this is something that exists or is needed. Also not all neighborhoods are the same.

Commented [A16]: Increasing residential street connectivity encourages driving and cut-through traffic on smaller streets which has a negative impact on pedestrian and bicycle traffic.

Commented [A17]: Source?

Commented [A18]: Many of our major roads lack adequate – or even any – sidewalks.

Commented [A19]: Metro loses riders due to unreliability, repair issues, and high fare cost. Significant funding will be needed to make metro more accessible for equity purposes and overall a more attractive option for travel.



The failure to provide robust alternatives to driving and the inability to provide additional space for roads – in combination with low rates of housing construction – leaves more commuters stuck in traffic and pushes jobs as well as people to other jurisdictions. The result is that the county loses residents, jobs, and tax revenue while simultaneously increasing traffic congestion as more people drive through the county on the way to jobs and homes in other places. Meanwhile, the importance of virtual connections, including the deployment of high-speed wireless networks and fiber optic cable, continues to grow.

What policies will solve the problem?

Successful mixed-use centers require a transportation scheme that supports modes of travel appropriate to the trips users need to make to meet their needs. For example, a rail-based transit line may serve to connect jobs to housing in different parts of the county or region, while sidewalks and bikeways connect offices to shops, restaurants, transit stations, or apartment buildings in a town center or between a downtown and the residential neighborhoods surrounding it. The point of this plan's emphasis on supporting alternatives to automobile travel is not to eliminate driving, but to make short trips around town by bicycle or bus safe and appealing. A quick trip to the grocery should be manageable on foot, while a visit to another town might require a trip by car, train, or even airplane. The most desirable places to live and work are the ones that offer a menu of choices that make all sorts of travel effortless and delightful, efficient and efficient while supporting best practices in land use rather than relying on a single mode of travel at the expense of every other consideration.

Recent and ongoing advances in technologies and travel modes may have a dramatic impact on the nature of travel demand. These include—but are not limited to—the introduction of or expansion in electric vehicles, connected and automated vehicles, delivery drones, ridehailing, bikesharing, dockless bikes and scooters, and telecommuting.

Commented [A20]: But isn't this what Thrive wants, fewer roads? And isn't adding connections creating new roads?

Commented [A21]: We are preparing for 200,000 new people. Are we losing people or gaining people?

Commented [A22]: This is a communication network sentence that shouldn't be with roads (confusing). The importance is not only deployment, but pricing so that everyone can afford access to what is deployed. Equity

Commented [A23]: We don't rely "on a single mode of travel at the expense of every other consideration". We have metro rail, buses and also roads for cars and garages. Thrive should examine why transit is not more popular and propose solutions. The cost of metro is high and reliability is poor. Bus travel is slow.

Commented [A24]: Charging stations are a significant impediment to expanding EVs everywhere and the plan does not acknowledge this infrastructure challenge or suggest solutions. BG&E has implemented a plan in its jurisdiction and MOCO should be planning for the necessary infrastructure for promoting expanded EV use.

Commented [A25]: Ridehailing and ridesharing are different? Ride hailing is not a shared ride, it's essentially call-for-service taxi just for one passenger or group.
Definition at <https://dictionary.cambridge.org/us/dictionary/english/ride-hailing>. "Travel surveys consistently reveal that only about 20 percent of TNC trips [transportation network companies] replace personal car trips. Another 20 percent replace traditional taxi services. The bulk of TNC trips — 60 percent — either replace transit, biking, and walking, or would not have been made without the availability of TNCs."

Finally, robust investment in the county's digital infrastructure is needed to connect residents to online job opportunities, encourage continued teleworking to reduce commuting trips, dilute rush-hour traffic, enhance worker productivity and improve quality of life, increasing the county's overall **attraction attractiveness** and **competitiveness**.

The county **will-should** base its efforts to improve connectivity on the following policies and practices: **Develop through master plans a safe, comfortable and appealing network for walking, biking, and rolling.**

- Expand the street grid in downtowns, town centers, transit corridors, and suburban centers of activity to create shorter blocks. (Ec, Env)
- Stop proposing new 4+ lane roads in master plans. (Env)
- Give a lower priority to construction of new 4+ lane roads, grade-separated interchanges, or major road widenings. (Env)
- Convert existing traffic lanes and on-street parking to create space for walkways, bikeways, and street buffers with landscaping and street trees, in a manner consistent with other County **policies**. (Env)
- Prioritize the provision of safe, comfortable, and attractive sidewalks, bikeways, roadway crossings, and other improvements to support walking, bicycling, and transit usage in capital budgets, development approvals and mandatory referrals. (Env)
- Transform the road network by incorporating complete streets design principles with the goal of eliminating all transportation-related roadway fatalities and severe injuries. **and supporting the emergence of more livable communities**. (Eq,)

Build a world-class transit system.

- Build a network of rail, bus rapid transit, and local bus infrastructure and services that make transit the fastest, most convenient and most reliable way to travel to centers of economic, social and educational activity and opportunity, both within and beyond Montgomery County. (Ec, Eq, Env)
- Convert existing general purpose traffic lanes to dedicated transit lanes, in a manner consistent with other County **and State** policies. (Ec, Eq, Env)
- Connect historically disadvantaged people and parts of the county to jobs, amenities, and services by prioritizing investments in increasing access to frequent and reliable all-day transit service. (Eq, Env)
- Ensure safe and comfortable access to transit stations via walking, rolling, and bicycling. (Eq, Env)

Adapt policies to reflect the economic and environmental costs of driving alone. (Eq, Env)

- Employ pricing mechanisms, such as congestion pricing or the collection and allocation of tolls to support walking, rolling, bicycling, and transit. (Env)
- Manage parking efficiently by charging market rates and reducing the supply of public and private parking. (Ec, Env)

Commented [A26]: Communication again here and should have its own section within this section of Thrive

Commented [A27]: This suggests narrowing existing streets and should take into account street parking rules and access by fire trucks which are built for the lanes we have now.

Commented [A28]: Does this work against increasing bus transport and ride sharing if lanes are removed, and more congestion?

Commented [A29]: Makes driving more expensive and penalizes people who can't walk or roll to work, doctors, groceries, and may be inequitable to lower income residents

- Encourage the proliferation of non-polluting vehicles by upgrading government fleets and requiring appropriate infrastructure. (Env)
- ~~These proposed policies should be evaluated to ensure equitable impacts from policies affecting certain types of vehicles users – like congestion pricing on minorities with high auto ownership.~~

Develop and extend advanced communications networks

- Facilitate construction of high-speed fiber optic and wireless infrastructure and other information and communication technology to supplement transportation links with improved virtual connections. (Ec, Eq,)
- Focus investment in communications infrastructure and services to connect people and parts of the county that lack convenient access to jobs and educational opportunities. (Eq)
- Support teleworking by accelerating deployment of information and communications technology and making working from home easier by facilitating Complete Communities. (Ec, Env)

~~These proposed policies should be evaluated to ensure equitable impacts from policies affecting certain types of vehicles users – like congestion pricing on minorities with high auto ownership.~~

How these policies will serve the goals of Thrive Montgomery 2050?

Walkable, bikeable, transit-connected neighborhoods and commercial districts support economic vitality.

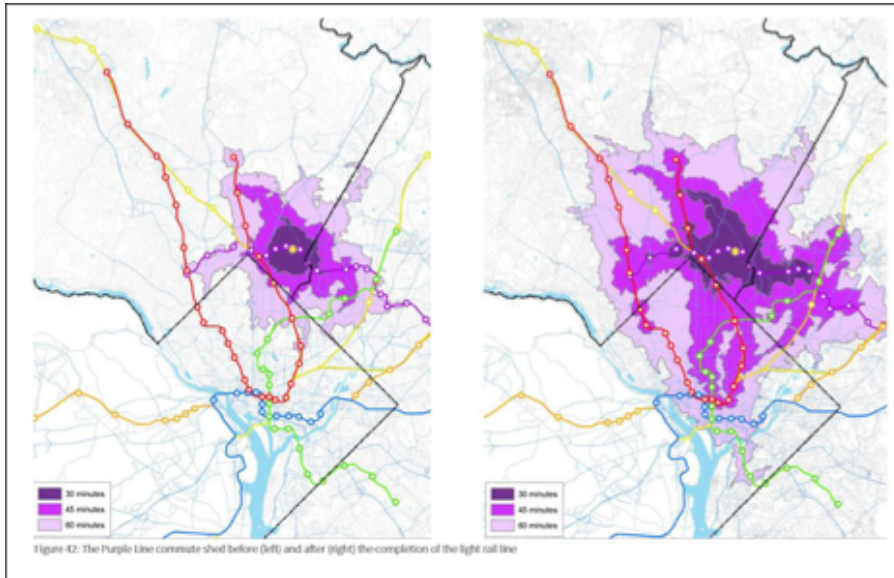
These policies are not enough by themselves to ensure the county’s economic success, but they are **essential-important** building blocks for stronger economic performance. Better transit connections to job centers, for example, **will maywill help** make the county a more attractive choice for employers by making it easier for their current and future employees to get to work. The total number of jobs within a 30-minute commute is a common measure of an area’s suitability for investment. With drive times and pass-through automobile traffic predicted to continue growing, investments in transit can significantly increase our “commute shed” and **help to** avoid ever-longer drives to and from work.

Commented [A30]: Require what infrastructure based on what technology and who will pay for and build it?

Commented [A31]: Doesn’t belong in communication networks. Shouldn’t this be a caveat on many of the transportation policies?

Commented [A32]: Communications needs its own section within this chapter

Commented [A33]: Doesn’t belong in communication networks, and

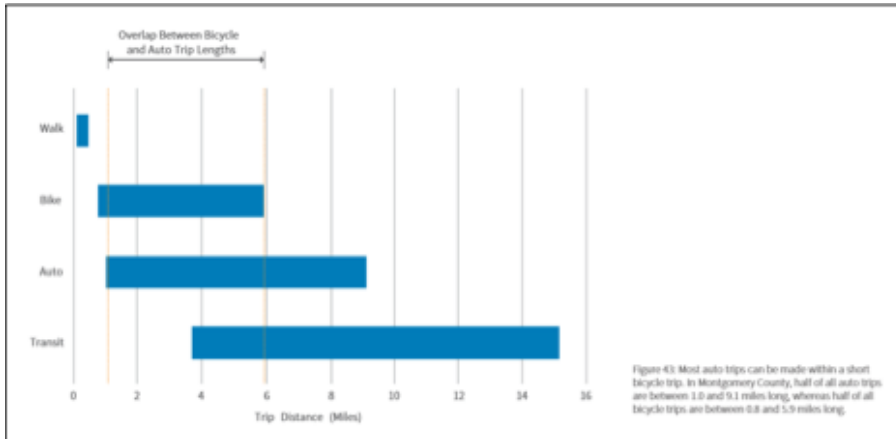


A higher priority for investments in transit, walking, rolling, and bicycling infrastructure is also critical to building Complete Communities that have the amenities, sense of place, and level of activity that more and more people of all backgrounds and ages are seeking. This ~~can be true because transit exerts a gravitational pull on real estate development by creating~~ incentives and opportunities to locate a variety of uses, services, and activities near station locations – and to each other.

Another essential building block of economic competitiveness is information and **communications** technology and telecommunications networks. Montgomery County should continue to prioritize advancing new technologies and making deployment of high-speed wireless networks and fiber optic cable – or other new communication systems – an important part of infrastructure **planning**.

Commented [A34]: This is communication tech and needs its own section in this chapter

Commented [A35]: This paragraph is redundant. There should be language in a communications section about providing for equity for people who can't afford to subscribe to new technology. Segments of the population are already priced out of access to internet. The plan should include policies for incentives or requirements for carriers to offer free and or reduced prices to vulnerable communities.



Expanding alternatives to driving helps build more equitable communities

A transit-focused approach that facilitates walking, rolling, and bicycling also promises to serve our residents more equitably. Enhanced access to jobs via transit, walking, rolling and bicycling will help mitigate inequities for people of color and low wage earners who are more likely to live in areas without adequate infrastructure to meet their mobility needs without an automobile. People in these communities are less likely to own a car and lack access to high-quality transit service that operates frequently ~~and~~, reliably, and at accessible cost throughout the day and into the evening. Expanded transit service also serves as an affordable and attainable housing tool by connecting areas where housing is relatively inexpensive to jobs, schools, and amenities without subjecting residents to high transportation expenses or impractically long commutes.

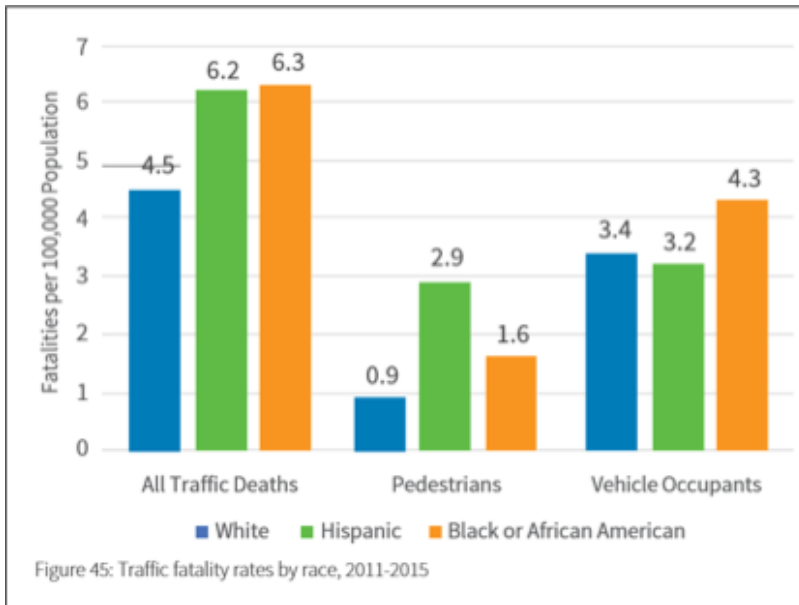
The ~~reordered~~ transportation priorities in this plan will help meet the county’s goal of eliminating all traffic-related fatalities and severe injuries by 2030, which is especially important in making transportation more equitable because people of color are more likely to be hurt or killed in crashes. Streets that go beyond safety to make walking, rolling, and bicycling preferred ways of getting around will can enhance human interaction and build social capital. Pedestrian-friendly rural, suburban, and urban centers will enjoy the benefits of an create build a stronger sense of place where the conditions for high levels of civic participation and a feeling of community are far easier to create and maintain.

As part of the focus on equity for all communities in the county, it is also important to prioritize providing high-speed internet access to all parts of the county. Future communication infrastructure and technologies should be deployed equitably throughout the county.

Commented [A36]: Metro is too expensive for some residents

Commented [A37]:

Commented [A38]: This comment is repeated throughout the document and is also incomplete. To be equitable there needs to be more than just deployment of communication networks. Regulations need to create access for economically challenged residents and funding for computers for economically residents.



Land use and transportation strategies that encourage walking, biking and transit use improve environmental performance

The evolution of corridors ~~was~~ originally planned for the convenience of drivers. ~~This plan contemplates~~ ~~into~~ multimodal streets where transportation and land use are harmonized to support ~~focused~~ development of a compact mix of uses and building types, ~~will to~~ reduce driving and make our transportation system more sustainable and resilient. ~~In particular, filling~~ ~~Filling~~ in missing connections ~~between streets~~ and breaking up large blocks to create a finer-grained network of streets along our suburban corridors will be challenging. ~~However, but~~ ~~A~~ more connected street grid is perhaps the single most important step to make our streets safer, more attractive for walking, biking and rolling, and reconnect communities divided by ~~overbuilt~~ highways. An interconnected grid system will increase choice of modes, provide multiple routes for travel, and be better equipped to handle extreme weather and other disruptions. For this reason, the addition of local street connections should be a top priority in both capital budgets and development review.

Investing in pedestrian, bicycling, and transit infrastructure will make active transportation a viable alternative to ~~many~~ vehicle trips and should ~~also~~ be a high priority in capital budgets. Bicycling has especially strong potential as a substitute for automobile trips of less than 3 miles, which comprise about half of all trips taken in the ~~region~~. ~~Survey~~ research demonstrates that bicyclists are much more likely to say they enjoy their commute than people who use other modes to get to work. Integrating pedestrian and bicycling infrastructure in parks and open spaces will extend the transportation network and expose more residents to nature on a daily basis, boosting mental and physical health.

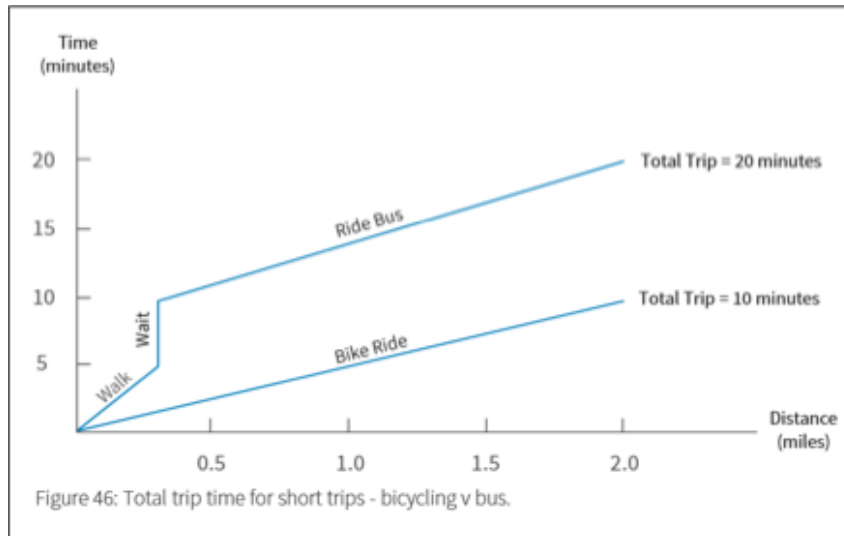
Commented [A39]: Why more streets if Thrive wants to reduce driving? Pedestrian and bike paths between streets would accomplish this without increasing car cut-through traffic which is unsafe, particularly to pedestrians.

Commented [A40]: Bicycling is not a realistic alternative for many if not most people – seniors, disabled, many families.

Commented [A41]: This seems inconsistent with the statement earlier that bicycling makes up less than 1% of bicycle ridership for all trips taken in the county.

Commented [A42]: Is there evidence of bike counts done as car counts are done?

As indicated in the introductory chapter of this plan, Montgomery County has made progress in reducing its greenhouse gas emissions but has much farther to go to meet its goal of eliminating them by 2035. In addition to transitioning from carbon-based fuels to renewable energy sources, reducing vehicular travel is **critical**.



Commented [A43]: This sentence is redundant and out of place. Should be deleted

Reducing the supply of parking – and the amount of land allocated to parking spaces – over time will increase the amount of space available for economically productive activity, reduce the cost of development, and relieve pressure on undeveloped land, all of which will enhance the county’s economic and environmental performance. Shared parking strategies and eliminating minimum parking requirements for new developments promote mixed-use development, improve pedestrian-friendly design, and encourage social interaction, while redevelopment of parking lots into higher and better uses improves environmental sustainability by creating opportunities to add tree cover, incorporate infrastructure for stormwater management, and create more landscaped areas that provide habitat for local pollinators, birds, and animals.

How will we evaluate progress?

In assessing proposals related to transportation and communications and measuring the success or failure of the approaches recommended in this plan, relevant measures may include:

- Vehicle Miles Traveled (VMT)
- Non-Auto Driver Mode Share (NADMS)

Commented [A44]: What is the source for these numbers? The bike speed extrapolates to 12 miles per hour, very fast for urban conditions. This chart does not accurately reflect, for example, the average biker heading into and through Bethesda from a nearby residential area. The chart suggests everyone can do this, without consideration for fitness, age, traffic signals, and congestion.

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- Average commute time, by mode
- Difference between average commute time by car and transit
- Person Trip accessibility for pedestrians and bicyclists
- Accessibility by all modes and especially via transit
- Number of traffic-related severe injuries and fatalities
- Transportation system's GHG emissions
- Miles of auto travel lanes per capita
- Teleworking
- Motor vehicle parking per unit of development
- Access to high-speed wireless networks

Note that many of these metrics have an equity component and should be evaluated through an equity lens.

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