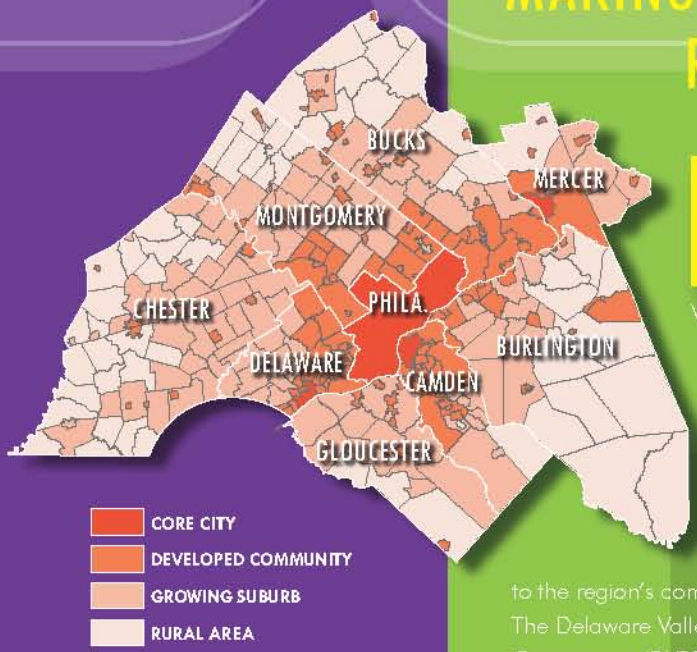
the LINK

CONNECTIONS

THE REGIONAL PLAN FOR
A SUSTAINABLE FUTURE

MAKING the LAND USE CONNECTION: REGIONAL WHAT-IF SCENARIOS



Imagine the future of the Delaware Valley if sprawl accelerates, with a lot of growth taking place on the edges of the region … or people and employment return to the region's commercial centers. The Delaware Valley Regional Planning Commission (DVRPC) has recently conducted a scenario planning exercise that does just that. This study compares the magnitude of impacts for two extreme settlement patterns – a ***Recentralization*** of population and jobs back into the region's centers, and an acceleration of ***Sprawl*** into the region's outlying areas. A third scenario, based on current ***Trends***, serves as a benchmark to the two extreme scenarios. The scenario analysis is intended to help better understand how different development patterns could affect land use, transportation, the environment and economic competitiveness and to highlight trade-offs between scenarios.

All scenarios forecast a total regional population of 6.15 million and employment of 3.15 million in 2035. The difference is where individuals will live and work. Each municipality in the region is classified by planning areas such as core cities, developed communities, growing suburbs or rural areas in DVRPC's current long-range plan, *Destination 2030*. The Recentralization scenario locates most population and employment growth in the region's core cities and developed communities with more reuse and densification of already developed areas. The Trend scenario foresees some of the region's residents and jobs moving away from existing developed communities and relocating - along with future population and employment growth - in growing suburbs and rural areas. Development will mostly occur in currently undeveloped areas with some infill site reuse. The Sprawl scenario accelerates this trend, with population and job losses in developed areas and more gains in outlying suburbs and rural areas that are currently open space.

2035

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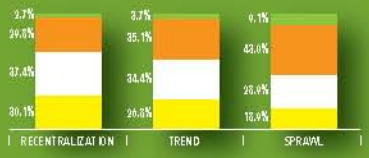
EVALUATING the PLANNING AREAS

Future municipal population and employment levels are forecast for each scenario for the four types of planning areas: rural areas, growing suburbs, developed communities and core cities. Each area reflects differing rates of infill as well as new growth in undeveloped areas, often known as "new footprint development." DVRPC's UPlan land use model allocates new footprint development by simulating the economic and policy forces that shape where households and commercial interests locate in the region.

POPULATION BY PLANNING AREA

EMPLOYMENT BY PLANNING AREA



The average household in core cities and developed communities is more compact; uses less energy to heat and cool; has lower rates of vehicle ownership and drives fewer vehicle miles. Core cities and developed communities have better transit - leading to more usage; and tend to complete more trips by walking or bicycling. Average households in growing suburbs and rural areas are larger; requiring additional land to be developed and more energy to heat and cool. They are less likely to have transit access, meaning more auto dependence, while walking and biking tends to be for recreation.

CHART / DATA SOURCE: DVRPC 2008

LAND USE

BUILDING OUT OR BUILDING UP?

By concentrating on compact, infill development, DVRPC's Recentralization scenario saves existing open space. This scenario could preserve 163,000 acres compared to the current trend, an area roughly the size of Camden County. Of these acres, 71,800 are currently used for agriculture, and 37,600 are forested. By reserving more land for agricultural use, the region should be better able to respond to changes in global trading, specifically those related to shifts in food and energy prices. This allows for more locally grown food, providing economic and nutritional benefits for the region's residents.

Under the Sprawl scenario, an additional 309,000 acres would be developed in the region compared to the current trend, an area roughly the size of Montgomery County. This would result in the loss of 168,000 agricultural acres in the region and 137,000 wooded acres.

The wetlands and forests that remain intact in the Recentralization scenario will continue to filter out pollutants, mitigate flooding, and reduce erosion and stormwater runoff. The Sprawl scenario, on the other hand, would develop a considerable portion of the region's existing open space, creating more pollution, while at the same time reducing the ability of the ecosystem to mitigate the negative impacts of pollutants.

MOVING THE REGION BY TRANSIT

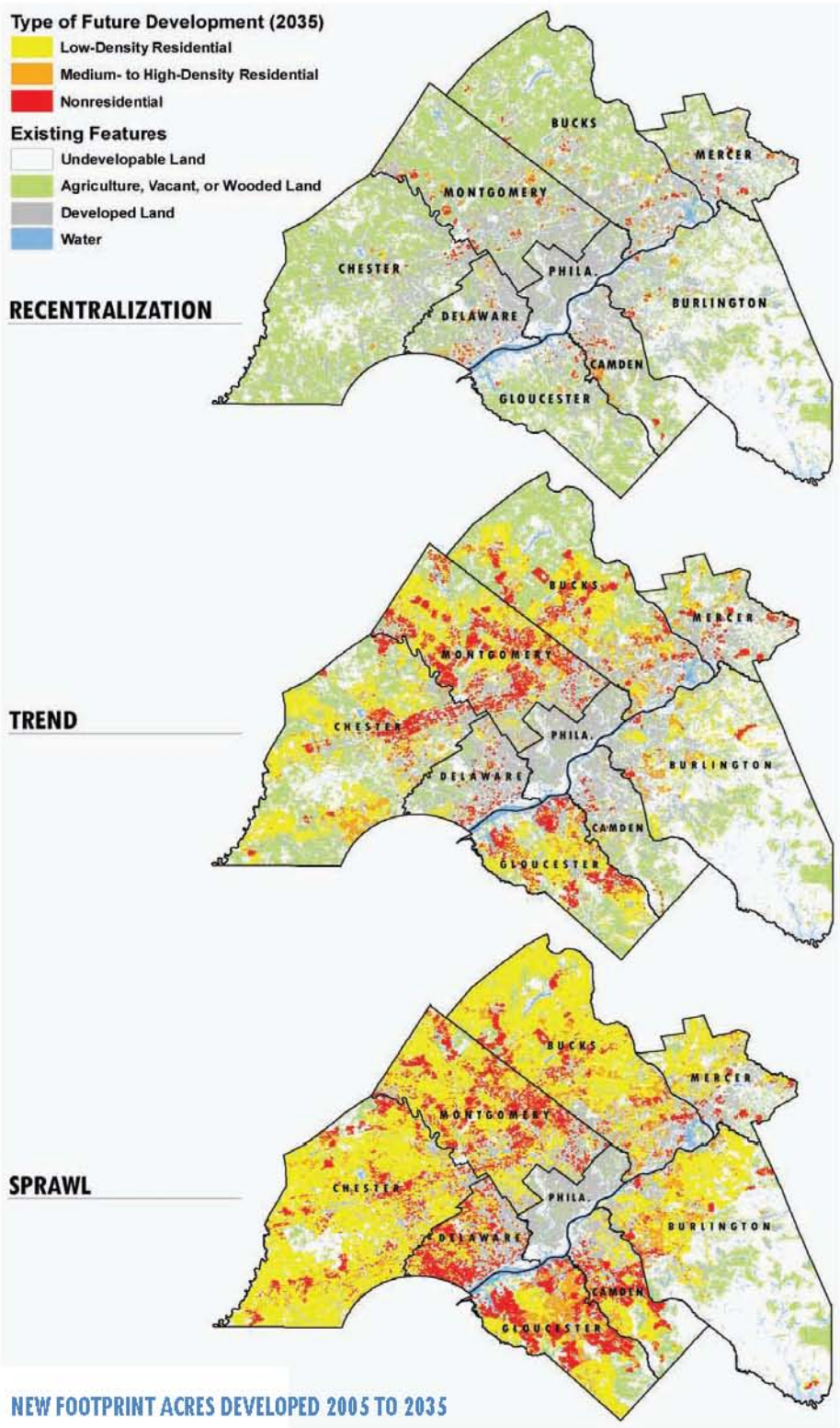
In addition to consuming what is currently open space, the Sprawl scenario locates many new jobs and housing units in areas of the region that lack transit access. This scenario anticipates that the current number of jobs and housing units with transit access will decrease by 159,000 and 83,500 respectively in 2035. The diffuse nature of the sprawl scenario makes it difficult to create new transit service in an economically feasible way.

The Recentralization scenario could add more than 190,000 new households and 257,000 new employment in areas with existing transit access. Increasing employment and the number of households with transit access encourages transit ridership, and reduces automobile driving and air pollution.

CHANGE IN TRANSIT ACCESS 2005 TO 2035

CHART / DATA SOURCE: DVRPC 2008

NEW FOOTPRINT DEVELOPMENT 2005 TO 2035



NEW FOOTPRINT ACRES DEVELOPED 2005 TO 2035

ACRES	RECENTRALIZATION	TREND	SPRAWL
AGRICULTURAL	2,740	74,500	242,000
WOODED	1,970	39,600	167,000
OTHER VACANT	1,090	54,900	69,000
TOTAL	**5,800**	**169,000**	**478,000**
REGIONAL AVERAGE RESIDENTIAL LOT SIZE (IN ACRES)	0.28	0.34	0.45

TABLE DATA SOURCE: DVRPC 2008

The wetlands and forests that remain intact in the Recentralization scenario will continue to filter out pollutants, mitigate flooding, and reduce erosion and storm water runoff. The Sprawl scenario, on the other hand, would develop a considerable portion of the region's existing open space. This scenario creates more pollution, while at the same time reducing the ability of the ecosystem to mitigate the negative impacts of pollutants.

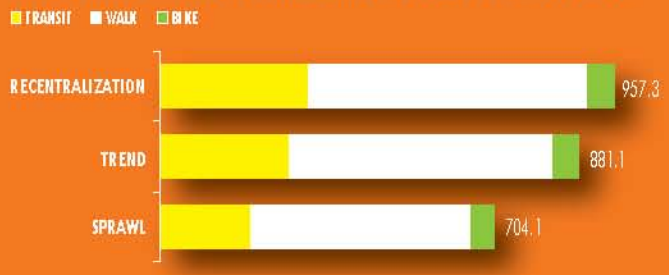
TRANSPORTATION

BUILD HIGHWAYS OR EXPAND TRANSIT?

The Recentralization scenario locates more population and jobs in areas that are already served by transit. As a result, this scenario could increase transit ridership by 14 percent in 2035, compared to the current trend. With fewer households and jobs located near transit in the Sprawl scenario, there will likely be 30 percent fewer transit trips compared to the trend. Transit is a more sustainable form of transportation, as it uses considerably less energy and produces lower greenhouse gas emissions per passenger mile than automobiles.

The more compact nature and mixed use development pattern of the Recentralization scenario can also encourage more walking and biking trips. This scenario is estimated to increase pedestrian trips by 6.5 percent and bicycle trips by 4.6 percent in 2035 compared to the trend. The Sprawl scenario anticipates 16.1 percent fewer walking and 9.9 percent less bicycling trips than the trend in 2035.

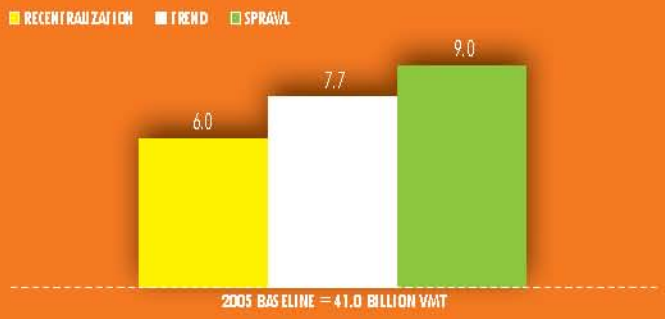
ALTERNATIVE TRANSPORTATION TRIPS IN 2035 (MILLIONS OF TRIPS)



KEY TRANSPORATION INDICATORS

INDICATOR	RECENTRALIZATION	TREND	SPRAWL
ANNUAL VEHICLE-MILES TRAVELED (BILLIONS OF VMT)	47.0	48.7	50.0
ANNUAL VEHICLE TRIPS (BILLIONS)	7.60	7.80	8.29
ANNUAL CRASHES	62,400	64,600	66,600
AVERAGE PEAK PERIOD ROADWAY SPEED (MPH)	30.2	29.7	28.6
ANNUAL TRANSIT TRIPS (MILLIONS OF LINKED TRIPS)	310.2	272.5	190.2
ANNUAL PEDESTRIAN TRIPS (MILLIONS)	590.4	554.3	465.0
ANNUAL BICYCLE TRIPS (MILLIONS)	56.8	54.3	48.9

NET CHANGE IN ANNUAL VMT 2005 TO 2035 (IN BILLIONS)



Population and employment is highly decentralized in the Sprawl scenario, increasing the region's auto dependency. This scenario projects an additional 1.3 billion vehicle miles traveled (VMT) in 2035 and an extra 28.5 billion cumulatively from 2010 to 2035 compared to the trend. With more use of alternative transportation modes, the Recentralization scenario forecasts lower VMT than the trend. This scenario could reduce annual VMT in 2035 by 1.7 billion miles compared to the trend and by 3.0 billion miles compared to the Sprawl scenario. Over the 25-year life of the Connections Plan, the Recentralization scenario could reduce VMT by 39 billion miles compared to the trend.

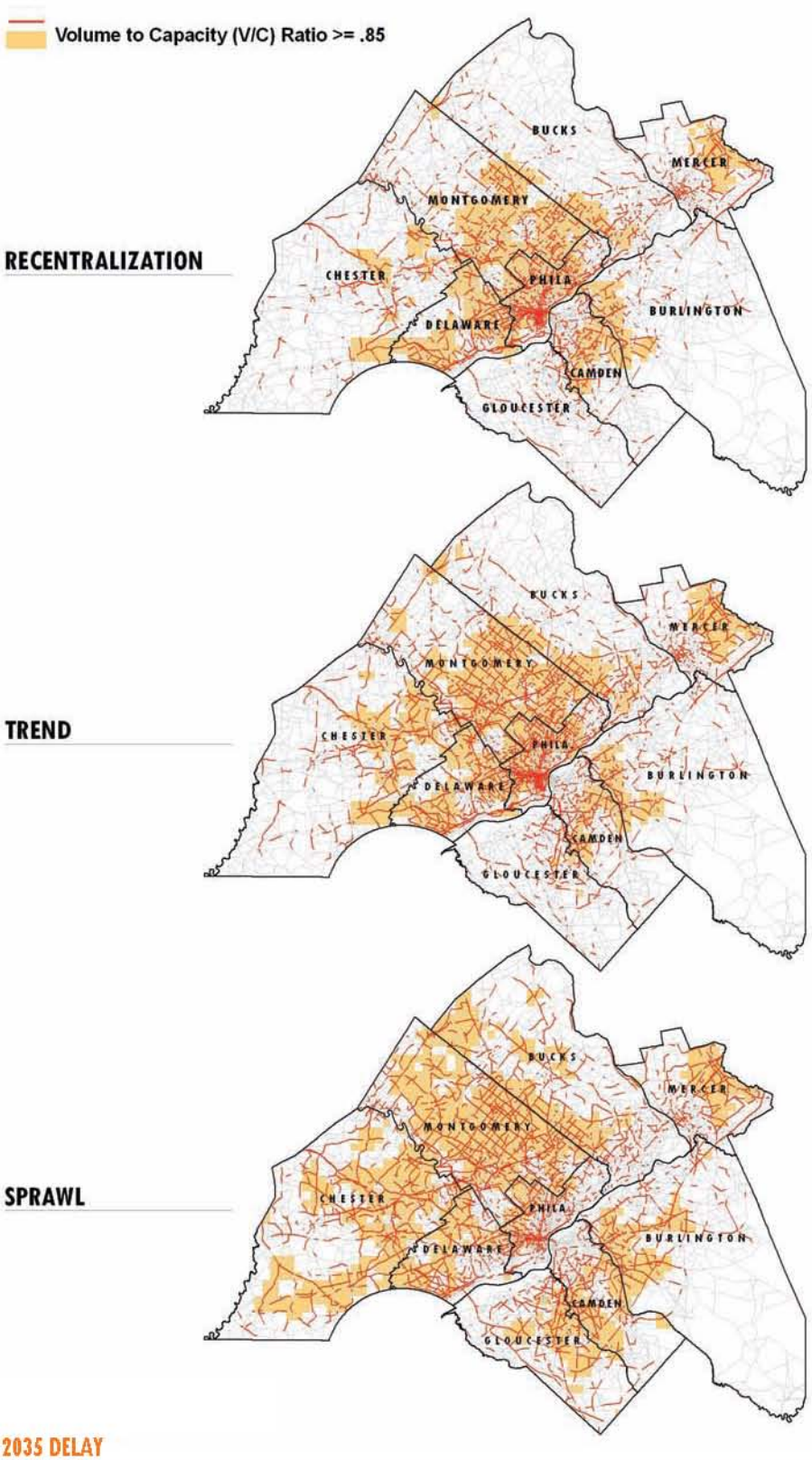
Fewer VMT in the Recentralization scenario will likely reduce the number of vehicle crashes in 2035, an estimated reduction of 4,200 compared to the Sprawl scenario and 2,200 fewer crashes than the trend.

Reduced driving means time spent on congested roadways. In 2035, the Recentralization scenario could reduce person hours of delay due to congestion by 24 million hours regionwide, or four hours per capita, compared to the trend; and by 56 million person hours of delay, or nine hours per capita, compared to the Sprawl scenario. The Recentralization scenario could save 1.25 working days per capita of time spent driving in 2035 while in the Sprawl scenario each resident will likely spend the equivalent of one extra working day per year behind the wheel of an automobile.

The region will need to make investments in new transportation capacity in order to meet the needs of population growth and to maintain economic competitiveness. The more compact nature of the Recentralization scenario means that transit and alternative transportation modes can play a major role in fulfilling future travel needs. The more decentralized Sprawl scenario will likely mean that new or widened roads will be the primary solution to meeting future demand.

ALL CHART / TABLE DATA SOURCE: DVRPC 2008

PEAK HOUR CONGESTION IN 2035



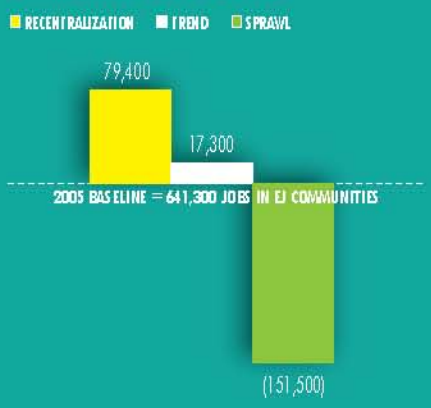
2035 DELAY

INDICATOR	RECENTRALIZATION	TREND	SPRAWL
ANNUAL WASTED TIME (MILLIONS OF PERSON HOURS OF DELAY)	146.3	170.3	202.3
ANNUAL HOURS OF DELAY PER CAPITA	23.8	27.7	32.9

TABLE DATA SOURCE: DVRPC 2008

The region will need to make investments in new transportation capacity in order to meet the needs of population growth and to maintain economic competitiveness. The more compact nature of the Recentralization scenario means that transit and alternative transportation modes can play a major role in fulfilling future travel needs. The more decentralized Sprawl scenario will likely mean that new or widened roads will be the primary solution to meeting future demand.

JOBS CREATED IN ENVIRONMENTAL JUSTICE COMMUNITIES 2005 TO 2035



ENVIRONMENTAL JUSTICE

Environmental justice (EJ) is an assessment used to mitigate potential direct and disparate impacts of the planning process and development projects on defined minority groups, persons with disabilities, and lower-income populations in the Delaware Valley region. DVRPC recognizes eight degrees of disadvantage, which is defined as exceeding the regional average for each of the following population groups: non-Hispanic minorities; Hispanic minority; elderly; physically disabled; female-headed households with child; carless households; low-income households; and limited English proficiency. A key issue for these communities is job access. The trend anticipates increasing jobs in disadvantaged EJ communities by approximately three percent over the 30-year planning period. The Recentralization scenario would increase the current total by 12 percent, while the Sprawl scenario is forecast to result in the loss of 24 percent of the existing job base in these communities.

the ENVIRONMENT

SELECTING A SUSTAINABLE SOLUTION

Increased use of alternative modes of transportation and fewer vehicle miles traveled can reduce vehicle-based emissions. By 2035, the Recentralization scenario could lead to an annual reduction of 20 tons of Fine Particulate Matter ($PM_{2.5}$), more than 400 tons of Volatile Organic Compounds (VOCs), and 260 tons of Oxides of Nitrogen (NO_x) compared to the trend; and by 40 tons of $PM_{2.5}$, 700 tons of VOCs, and 400 tons of NO_x released into the atmosphere compared to the Sprawl scenario. VOCs and NO_x form ground-level ozone and more emissions worsen the region's air quality. This will negatively affect the health of individuals who suffer from asthma, bronchitis, heart, other respiratory illnesses, as well as damage crops and lower water quality.

DIFFERENCE IN DAILY VEHICLE EMISSIONS BY SCENARIO IN 2035

INDICATOR	RECENTRALIZATION	TREND	SPRAWL
NO_x (TONS/YEAR)	7,700	7,960	8,100
VOC (TONS/YEAR)	10,800	11,210	11,500
$PM_{2.5}$ (TONS/YEAR)	640	660	680

Average households in the Recentralization scenario will require 0.4 percent less energy to power, heat, and cool than average households under current trends. Conversely, average households in the Sprawl scenario will need 2.9 percent more energy per household than in the trend. Motor vehicle fuel use is 3.4 percent lower in the Recentralization scenario than in the trend. In the Sprawl scenario, vehicle fuel use is 2.6 percent higher than in the trend. By using less energy to power, heat and cool residences and for driving in the recentralization scenario, CO_2 emissions from residential and vehicle energy use could be decreased by 1.2 million tons in 2035, or by about 15 million tons over the life of the *Connections* Plan compared to the trend. This is the equivalent of planting more than 28 million trees in the region. The Sprawl scenario will likely emit 2.0 million additional tons of CO_2 from transportation and residential energy consumption in 2035, and about 25 million tons of CO_2 emissions over the life of the *Connections* Plan, compared to the trend. This would require planting more than 47 million trees in the region to offset these additional emissions.

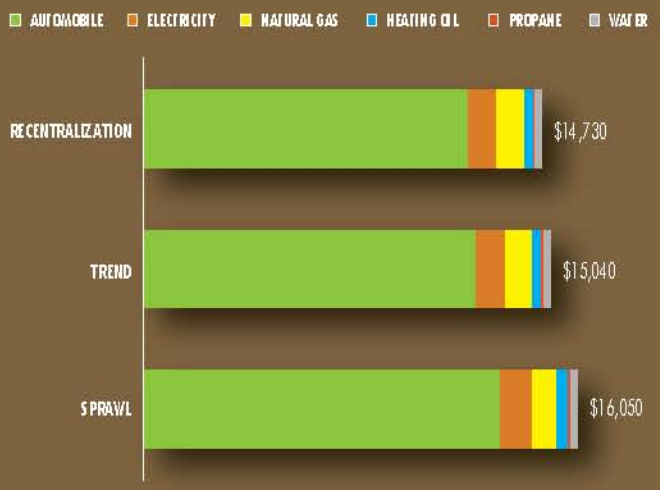
ALL CHART / DATA SOURCES: DVRPC 2008

2035 RESIDENTIAL ENERGY AND MOTOR VEHICLE GHG EMISSIONS (MMTCO2E)

Global climate change threatens ecosystems around the planet, and our economy continues to be highly dependent on an uncertain future supply of petroleum. Solutions to both of these issues are also related to increasing energy efficiency and finding less carbon-intense alternative fuels (neither of these are reflected in this scenario analysis). While no single solution will be capable of meeting the challenges of these twin crises, a series of partial solutions implemented together can achieve sustainability. The Recentralization scenario, by reducing energy demand and CO_2 emissions, can be a key part of this solution.

the ECONOMY

AVERAGE HOUSEHOLD AUTO AND UTILITY EXPENDITURES IN 2035



SUPPORTING INFRASTRUCTURE CAPITAL COSTS 2005 TO 2035

B = BILLIONS OF $s	RECENTRALIZATION	TREND	SPRAWL
SEWER AND WATER	$1.4 B	$2.2 B	$6.3 B
ROADS	$3.4 B	$5.8 B	$23.1 B
SCHOOLS	$2.7 B	$2.8 B	$6.3 B
TOTAL COST	**$7.4 B**	**$10.8 B**	**$35.6 B**
PER NEW HOUSEHOLD	$28,700	$37,500	$53,300

MOVING TOWARD ECONOMIC-EFFICIENCY

Utilizing and maintaining existing infrastructure rather than duplicating it with new facilities would provide major economic benefits to the region. Energy consumption can be reduced through more efficient land use such as higher density and mixed uses. This can make the region more energy independent and prepare it for future energy price volatility, while lowering greenhouse gas emissions. By returning population and jobs to older areas that have declined due to sprawl, municipal fiscal health can be improved. All of these reduce costs for businesses and residents, which enhances the region's economic competitiveness in the global marketplace.

DVRPC estimates that by using less energy to power households and automobiles, along with lower rates of auto ownership, the Recentralization scenario could save the average household $310 in annual auto and utility expenses compared to the current trend, and more than $1,300 compared to the Sprawl scenario.

The estimated total supporting infrastructure cost for schools, local roads, sewers, and water is $25 billion more under the Sprawl scenario than the trend. The Sprawl scenario projects more than twice as many new housing units and $15,900 higher per unit costs More greenfield development translates to additional lane miles of road, sewer line extensions, and new schools, all of which duplicate infrastructure already built in the region's developed communities and core cities. By more fully utilizing existing infrastructure, the Recentralization scenario could save a total of nearly $3 billion dollars, or $6,600 per new housing unit.

THE CHOICE FOR A BETTER FUTURE

Based on this analysis of impacts to land use, transportation, the environment, and economic competitiveness, DVRPC believes that the Recentralization scenario offers the best solutions for a sustainable future. This scenario offers a superior quality of life by increasing mobility choices, preserving more open space, and reducing demand for energy, which lowers household and business expenses. Denser, more compact development, with mixed land uses can shorten distances between origins and destinations, which encourages alternative forms of transportation. Less energy use helps to reduce CO_2 emissions, making the region more sustainable. By spending less on replicating existing infrastructure, more money can be invested in green and energy efficient technologies or alternative fuels. This in turn will help ensure that the region remains economically competitive in a fast and ever changing world.

NEXT STEPS

Making the Land Use Connection is intended to spur discussion of the long-range planning process and the region's vision for the future by analyzing the impacts of two extreme land use scenarios. Neither of these scenarios is likely to occur but by quantifying their impacts we can more fully see some of the costs involved in these land development patterns.

To further engage the region's residents in identifying a preferred scenario and discussing a shared vision for the future, DVRPC conducted a series of public workshops during the fall of 2008. DVRPC will use the public input from these workshops, a series of focus groups, and an online visioning survey, to identify goals for the *Connections* Plan, as well as the policies and strategies to achieve them. The next issue of *The Link* will explore these goals, and related strategies and policies for achieving them.

For more information about the *Connections* update to the region's long-range plan please visit www.dvrpc.org/connections. For a full copy of the *Making the Land Use Connection: Regional What-If Scenario Analysis* report go to http://www.dvrpc.org/connections/whatif.htm

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