The Natural Environment Recap
Plano Tomorrow Comprehensive Plan

On March 17, 2014, the Planning and Zoning Commission completed a work session for the natural environment component of the Plano Tomorrow Comprehensive Plan. At the work session, the Commission was provided a summary document, which contained descriptions of each topic along with three policy recommendations to consider. The policy options included the city's current policy, as well as alternative options to discuss. Each option included potential outcomes to better understand the effects of the policy decisions. The natural environment summary document provided to the Commission is included below as Exhibit B.1. The Commission recommended fifteen policy statements on the natural environment which are briefly summarized below.

The Natural Environment Vision
Plano should be a leader in "greening" the environment by making investments in renewable energy, efficient buildings, waste reduction, transportation, and future adaptation (air quality, stormwater management, open space and natural resource preservation). Plano's focus shouldn't solely rely on cost-effective environmental improvements, but should also focus on environmental investments that have a significant impact on citizen health and the natural environment.

Efficient Buildings – Building Codes
With the recommendations of North Central Texas Council of Governments, Plano should consider applicable portions of the International Green Construction Code (IgCC) and integrate these portions into the development process. Plano should also consider providing financial and/or regulatory incentives for green construction.

Efficient Buildings – Encouraging Retrofit of Existing Structures
Plano should consider expanding energy efficiency incentive and educational programs by partnering with private utility companies and local businesses to encourage the retrofit of existing structures.

Water Conservation
Plano should consider expanding water conservation educational/marketing programs and incentive programs for such items as: drip irrigation systems, rainwater collection and harvesting, air conditioning condensation harvesting, and drought tolerant landscaping.

Renewable Energy – Municipal Buildings
Plano should make significant investments in renewable energy for municipal buildings. Plano's focus shouldn't solely rely on cost-effective environmental improvements, but should also focus on building investments that have a significant impact on citizen health and the natural environment.

Renewable Energy – Municipal Electricity
Plano should be a leader of the Texas Coalition for Affordable Power (or any other future coalitions) and negotiate higher renewable energy minimums with the city's electric providers regardless if it increases the city's electricity rates.

Renewable Energy – Incentivizing Renewable Energy
Plano should provide incentives (financial or regulatory) for the use of renewable energy and partner with private utility companies and local businesses to encourage the retrofit of existing structures. Plano should also support private initiatives like Solarize Plano.

Waste Reduction
Nearing the city's 40% recycling diversion goal, Plano should increase the diversion goal and increase educational programs and incentives without adding new mandatory regulations.

Air Quality – Transportation Demand Management
Plano should commit to a Transportation Demand Management Program and meet with local corporations to identify the best policies for the program. Plano should actively pursue corporations to take advantage of the program.

Air Quality – City Fleet
Plano should pursue converting the city's fleet to alternative fuel or electric vehicles, using only the most cost effective methods.

Air Quality – Urban Heat Islands – Permeable Pavements
Plano should further incentivize the use of permeable pavement for non-residential developments and consider installing permeable pavement on municipal properties only if it is cost effective.

Air Quality – Urban Heat Islands – Urban Forestry
Plano should expand its Urban Forestry initiatives by leading a city-wide tree inventory study to determine the total canopy coverage, species, and long-term health of Plano's urban forest. The City would focus tree planting efforts, maintenance of existing trees, and education to areas of the city where UHI effect is greatest. Existing developments should be required to add landscaping only for significant redevelopment or expansion projects to bring the site into conformance with the Zoning Ordinance's landscaping requirements. Education on the benefits of trees and urban forests should be provided to the citizens.

Air Quality – Urban Heat Islands – Green Roofs/Cool Roofs
Plano should only retrofit municipal building roofs with cool or green roofs at the end of their lifespan if it is cost efficient and incentivize developers to incorporate cool or green roofing materials on residential and nonresidential developments.

Stormwater Management
Plano should only incorporate the most cost effective practices from North Central Texas Council of Governments' Best Management Practices to improve water quality on municipal owned sites, parkways, and roadway projects and should increase incentives for private new development and redevelopment projects.

Open Space and Natural Resource Preservation
Plano should pursue additional open space and trail connections to improve the quality of life for its citizens. This would include purchasing vacant and underutilized land for parks and open space and/or purchasing floodplain for trail connections.

Exhibit

The Natural Environment Summary Document

THE NATURAL ENVIRONMENT VISION

Current Comprehensive Plan Strategies (General Environmental)

- Increase public awareness about environmental issues.
- Develop educational materials and programs that can be used to inform the public on ways to improve the environment and conserve energy resources.

Plano has grown rapidly over the past 50 years, both in population and geographically. This growth presents challenges to the protection of the natural environment, including water, air, and the preservation of open space and natural resources. A healthy environment is critical to ensuring and sustaining a community that is healthy, productive, and resilient.

As we discuss the natural environment, it is important to have a clear vision of what the city should be doing today to reach the vision of a sustainable community. Several cities around the Metroplex, including Plano, are making great strides to become more environmentally friendly by requiring more energy efficient buildings, reducing waste, increasing mobility, and adapting to future environmental concerns such as air quality, heat islands, stormwater management, and open space and natural resource preservation. What Plano does today greatly influences how residents, businesses, and visitors will identify Plano in the future. Below are three broad natural environment statements that should be considered as a guiding vision for the subsequent environmental topics.

1. Plano should be a **leader** in "greening" the environment by making **significant investments** in renewable energy, efficient buildings, waste reduction, transportation, and future adaptation (air quality, stormwater management, open space and natural resource preservation).

   Pro: This may accelerate the creation of a healthier community for Plano's residents, businesses, and visitors.

   Con: Many "greening" investments are not cost effective at this time for the city.

2. Plano should **assist** in "greening" the environment by seeking only the **most cost effective methods** and ideas in renewable energy, efficient buildings, waste reduction, transportation, and future adaptation (air quality, stormwater management, open space and natural resource preservation).

   Pro: The city may make incremental, "green" investments that are cost effective.

   Con: Its unknown if every "green" investment will eventually be more cost effective than the alternative, which could delay implementation of improvements.

3. Plano should be a **spectator** in "greening" the environment by only making improvements in "greening" the environment that are **required by state or federal mandate**.

   Pro: This may ensure that the city is only making investments that are required by law.

   Con: The state and federal governments may take years to create mandates and city and regional environmental quality may continue to decrease.

4. **Recommended policy (combination of options 1 and 2) - Plano should be a leader in "greening" the environment by making investments in renewable energy, efficient buildings, waste reduction, transportation, and future adaptation (air quality, stormwater management, open space and natural resource preservation). Plano's focus shouldn't solely rely on cost-effective environmental improvements, but should also focus on environmental investments that have a significant impact on citizen health and the natural environment.**

The Natural Environment was divided into seven sections with eleven subsections. These sections were evaluated by the Planning and Zoning Commission and are discussed further in this summary report:

1) Efficient Buildings
   - Building Codes
   - Building Retrofit
2) Water Conservation
3) Renewable Energy
   - Municipal Buildings
   - Municipal Electric Providers
   - Incentivizing Renewable Energy
4) Waste Reduction
5) Air Quality
   a. Transportation Demand Management
   b. City Fleet
   c. Urban Heat Islands
      i. Permeable Pavements
      ii. Urban Forestry
      iii. Cool/Green Roofs
6) Stormwater Management
7) Open Space and Natural Resource Preservation

EFFICIENT BUILDINGS

Building energy efficiency is the first step toward achieving sustainability in buildings and organizations. Buildings can account for a large percentage of the city's emissions and energy efficiency helps control rising energy costs while reducing environmental footprints.

EFFICIENT BUILDINGS | BUILDING CODES

Current Comprehensive Plan Strategies

- Regularly monitor development and building regulations to ensure that they provide for the efficient use of natural resources and promote environmental quality. When possible, incorporate sustainable building and design practices into development regulations.

2012 International Energy Conservation Code - Code officials recognized the need for a modern, up-to-date energy conservation code addressing the design of energy-efficient building envelopes and installation of energy efficient mechanical, lighting and power systems through requirements emphasizing performance. The *International Energy Conservation Code*®, 2012 edition, was designed to meet these needs through model code regulations that result in the optimal utilization of fossil fuel and nondepletable resources in all communities, large and small.

The 2012 *International Energy Conservation Code*® (IECC) underwent extensive review through the North Texas Council of Governments and was recommended for adoption throughout the region. On October 28, 2013, the City of Plano adopted the *International Energy Conservation Code*® (IECC).

The US Department of Energy called the 2012 IECC "the largest, one-step efficiency increase in the history of the national model energy codes".

2012 International Green Construction Code - The IgCC is the first model code to include sustainability measures for the entire construction project and its site — from design through construction, certificate of occupancy and beyond. The new code is expected to make buildings more efficient, reduce waste, and have a positive impact on health, safety and community welfare.

The 2012 *International Green Construction Code*® (IgCC) is written to provide flexibility in construction for communities pursuing sustainable code methodologies that are higher performing than the traditional *International Energy Conservation Code*®. The IgCC can be customized, edited to fit a community, use project elective provisions and be tailored to establish several levels of compliance. The IgCC is intended to act as an overlay to the existing set of International Codes, including the International Energy Conservation Code and the ICC-700 (National Green Building Standard) and incorporates ASHRAE Standard 189.1 as an alternate path to compliance for new and existing buildings.

The International Code Council (ICC), the American Institute of Architects, ASTM International, ASHRAE (the American Society of Heating, Refrigerating and Air-conditioning Engineers), the

US Green Building Council, and the Illuminating Engineering Society jointly held hearings for three years to develop the IgCC, which included input from several code specialists, environmentalists, and members of the building industry. Through its use, the IgCC could be compared to an alternative to LEED.

The North Central Texas Council of Governments (NCTCOG) has established an Energy and Green Advisory Board to review the IgCC and make regional recommendations for municipal governments. The City of Plano has a representative who serves on this board, Robert Smouse, Environmental Waste Services Manager with the Public Works Department.

The City of Dallas is the only city in Texas that has adopted portions of the IgCC.

Options for Consideration: Building Efficiency

1. With the recommendations of NCTCOG, Plano should **strongly** consider adopting all or a portion of the IgCC to enforce mandatory "greening" requirements for buildings. Plano should also be an advocate to persuade other cities to adopt the green code.

   Pro: Plano may become a leader in building efficiency and the creation of a healthier community for Plano's residents, businesses, and visitors.

   Con: Requiring mandatory "greening" requirements for buildings may create a barrier for developers and discourage new development.

2. Plano should follow the regional discussions regarding the IgCC and **only** consider adopting all or a portion of the IgCC if other cities begin to adopt the code. Plano will continue to allow alternative "greening" building methods, but should consider providing financial incentives for green construction.

   Pro: By waiting for other cities to adopt the code, Plano reduces the risk of discouraging new development. Financial incentives may encourage developers to build green.

   Con: Financial incentives for green construction may become costly for the city.

3. Regardless of the recommendations from NCTCOG, Plano should **not enforce** any "greening" requirements for buildings, which are not required by the current 2012 International Energy Conservation Code (IECC). Plano will continue to allow alternative "greening" building methods; however, Plano should not provide financial incentives for green construction.

   Pro: No additional barriers are created for new development and there is no cost for providing financial incentives.

   Con: Other than adopting the 2012 International Energy Conservation Code (IECC), Plano may not encourage any other "greening" requirements that would make new developments more efficient.

4. **<u>Recommended policy (combination of options 1 and 2)</u> - With the recommendations of North Central Texas Council of Governments, Plano should consider applicable portions of the International Green Construction Code (IgCC) and integrate these portions into the development process. Plano should also consider providing financial and/or regulatory incentives for green construction.**

EFFICIENT BUILDINGS | ENCOURAGING RETROFIT OF EXISTING STRUCTURES

Current Comprehensive Plan Strategies

- Create a program to help homeowners and renters upgrade to more energy and water efficient homes
- Where possible, use building materials and equipment for municipal facilities and services that are energy efficient and protect the environment.

Building codes will regulate improvements for new buildings and significant remodels to existing buildings, but they do not encourage existing residential and non-residential developments to make smaller, energy efficient improvements. Currently, the City of Plano offers several educational programs and incentives for energy efficiency such as:

- Smart Energy Loan Program
- Housing Rehabilitation Program
- Educational online learning modules for energy efficiency
- Educational green building tips website including information regarding: appliances and electronics, insolation and air sealing, lighting, heating usage, and windows and doors
- Education/demonstration activities at the environmental education center

Options for Consideration: Encouraging Retrofit of Existing Structures

1. **Recommended policy- Plano should consider expanding energy efficiency incentive and educational programs by partnering with private utility companies and local businesses to encourage the retrofit of existing structures.**

   Pro: Incentives may encourage more homes and businesses to become energy efficient.

   Con: Incentives may require financial participation from the city.

2. Plano should consider expanding energy efficiency **educational programs only** to encourage the retrofit of existing structures.

   Pro: Educational programs may still encourage energy efficient in buildings without requiring any outside partnerships or financial participation.

   Con: Educational programs may be less encouraging than financial incentives.

3. Plano maintains current levels and should **not consider** expanding any additional incentive or educational programs to encourage energy efficiency and the retrofit of existing structures.

   Pro: Maintaining the existing programs would not require additional labor from city staff or additional funding for incentives.

   Con: There may be less encouragement for homes and businesses to become energy efficient.

WATER CONSERVATION

Current Comprehensive Plan Strategies

- Educate property owners on how to conserve water and sustain landscaping by providing educational materials within utility bills and on the city's website. Also, provide seminars on sustainability practices.
- Work with other water supply systems to ensure alternative sources of water in emergency situations. *(Currently not allowed per our contract for NTMWD)*
- Explore alternative water sources *(Currently not allowed per our contract for NTMWD)* and more efficient use of existing water sources. Identify sustainable practices that can be applied to the development, maintenance, and operation of parks and recreation facilities.
- Encourage city residents and businesses to conserve water.
- Ensure that Plano has the supply of water needed to meet long term needs.
- Ensure that the city has temporary water connections to address emergencies.

Water conservation in the North Texas region has become an important subject for Plano. Encouraging water conservation is one aspect that the city can actively pursue to address the water shortage that the North Texas region is experiencing.

Currently, the City of Plano offers several educational programs and incentives for water conservation such as:

- Water Conservation Rebate Program on rain/freeze sensors, rain barrels, and high efficiency toilets
- Rain barrel sales
- Educational green building tips website including information regarding landscaping and water
- Education/demonstration activities at the environmental education center
- Partnerships with Home Depot to provide discounted drought tolerant plants

Options for Consideration: Water Conservation

1. **Recommended policy - Plano should consider expanding water conservation educational/marketing programs and incentive programs for such items as: drip irrigation systems, rainwater collection and harvesting, air conditioning condensation harvesting, and drought tolerant landscaping.**

   Pro: Incentives may encourage more homes and businesses to conserve water.

   Con: Incentives may require financial participation from the city.

Options Continued on Next Page

2. Plano should consider expanding water conservation **educational and marketing programs only** to encourage conservation.

   Pro: Educational and marketing programs may still encourage and increase water conservation in buildings without requiring any financial participation.

   Con: Educational programs may be less encouraging than financial incentives.

3. Plano should maintain current levels and should **not consider** expanding any additional incentive or educational/marketing programs to encourage water preservation.

   Pro: Maintaining the existing programs may not require additional labor from city staff or additional funding for incentives.

   Con: There may be less encouragement for homes and businesses to preserve water.

RENEWABLE ENERGY

Current Comprehensive Plan Strategies

- Work with other jurisdictions to study the impact of future growth on long term energy needs.

Renewable energy has been an emerging topic in cities the past few years. Renewable energy includes solar, wind, geothermal, bioenergy, hydrogen, and ocean. There are a number of reasons why renewable energy is important to discuss including:

- Environmental Benefits – Renewable energy technologies are clean sources of energy that have much lower environmental impact than conventional energy technologies.
- Renewable – Renewable energy will not run out. Other sources of energy are finite and will someday be depleted.
- Jobs and the Economy – A majority of renewable energy investments are spent on materials and workmanship to build and maintain the facilities, rather than on energy imports. Renewable energy technologies developed and built in the United States are being sold overseas, providing a boost to the U.S. trade deficit.
- Decreasing Dependence – Renewable energy decreases the dependence of foreign oil.

RENEWABLE ENERGY | MUNICIPAL BUILDINGS

Plano has made all the smaller, cost effective improvements to city buildings and has made some significant investments in municipal buildings such as the Plano Environmental Education Center which is LEED Platinum and the Tom Muehlenbeck Recreation Center.

Options for Consideration: Renewable Energy | Municipal Buildings

1. **Recommended policy - Plano should make significant investments in renewable energy for municipal buildings.**

   Pro: The city may lead the movement for a cleaner, renewable energy source.

   Con: Many renewable energy investments are not cost effective for the city at this time.

2. Plano should only make the **most cost effective** renewable energy improvements for municipal buildings.

   Pro: The city may make incremental investments that are cost effective.

   Con: It's unknown if every investment will eventually be more cost effective than the alternative, which may delay implementation of renewable energy.

Options Continued on Next Page

3. Plano should **not invest** in renewable energy improvements for municipal buildings.

   Pro: New improvements require new training and employee specialties. This option may not require new training for employees.

   Con: The city may continue to operate on non-renewable energy sources, which may be depleting in the future.

RENEWABLE ENERGY | MUNICIPAL ELECTRICITY

Plano is part of the Texas Coalition for Affordable Power (TCAP), which includes more than 160 cities and other political subdivisions that purchase in excess of 1.3 billion kilowatt/hours each year. TCAP negotiates terms and conditions for electric service that may be unavailable to a single city acting alone. Plano's energy provider through TCAP is NextEra Energy, which provides 40% of its energy through wind power.

Options for Consideration: Renewable Energy | Electric Providers

1. **Recommended policy - Plano should be a leader of TCAP (or any other future coalitions) and negotiate higher renewable energy minimums with the city's electric providers regardless if it increases electricity rates.**

   Pro: The city may lead the movement for a cleaner, renewable energy source.

   Con: If individual electricity rates are increased for the city, there may be opposition from the general public.

2. Plano **should only** negotiate higher renewable energy minimums with the city's electric providers if it maintains or reduces existing electricity rates.

   Pro: Electricity rates may not be increased and the source of the energy is clean and renewable.

   Con: It may be years before the price of oil is above the price of renewable energy, so the city may continue to use a nonrenewable and less clean energy source until the price of renewable energy is more cost efficient.

3. Plano **should not** negotiate any additional renewable energy minimums with the city's electric providers.

   Pro: This may prevent any negative changes from the original providers and rates.

   Con: The city may continue to use a nonrenewable and less clean energy source until the source is completed depleted or a federal/state mandate requires the use of renewable energy.

RENEWABLE ENERGY | INCENTIVIZING RENEWABLE ENERGY

Similar to the building retrofit section, building codes will regulate improvements for new buildings and significant remodels to existing buildings, but they do not encourage existing residential and non-residential developments to make renewable energy improvements.

Options for Consideration: Renewable Energy | Incentivizing Renewable Energy

1. **Recommended policy - Plano should provide incentives (financial or regulatory) for the use of renewable energy by residents and businesses.**

   Pro: Incentives may encourage more homes and businesses to utilize renewable energy.

   Con: Incentives may require financial participation from the city.

2. Plano **should only provide educational/marketing material** for the use of renewable energy by residents and businesses and should support private initiatives like Solarize Plano.

   Pro: Educational programs may still encourage renewable energy in buildings without requiring any financial participation.

   Con: Educational programs may be less encouraging than financial incentives.

3. Plano **should not provide promotional material or incentives** (financial or regulatory) for the use of renewable energy by residents and businesses.

   Pro: This may not require additional labor from city staff or additional funding for incentives.

   Con: There may be less encouragement for homes and businesses to utilize renewable energy.

WASTE REDUCTION

Current Comprehensive Plan Strategies

- Regularly review waste and recycling collection to improve efficiency and cost effectiveness.
- Expand Plano's trash recycling program to include all commercial and residential properties in the city.

Reducing waste by recycling benefits the city in a number of ways. It conserves resources, saves energy, protects the environment, and reduces landfills. In 1999, the Plano City Council created a 40% city-wide recycling diversion goal. At that time, the city's diversion rate was 5%. As of the end of the 2013 fiscal year, the city's diversion rate was 37.8%. The latest studies from Green Dashboard indicate the national diversion average rate is between 33% and 35%. The city has been a regional leader in recycling, ranking in the top half of the North Central Texas Council of Government's Benchmarking Study in 2007 and again in 2010. The city provides several outreach programs to encourage recycling as well as offering single-stream recycling, organic recycling, and construction and demolition recycling. Construction and demolition recycling programs offer project superintendents and site managers an incentive for recycling construction debris such as concrete, wood and metal on new construction, alteration, remodeling and demolition projects. Educational programs provided by the city include:

- Online Learning Modules for Recycling and Composting
- Litter Cleanup Days and Informational Website
- Plano's Zero Waste Program
- Composting Classes and Fair

Several cities across Texas have increased recycling diversion goals including San Antonio (60%) by 2020, Dallas (60%) by 2030, and Austin (90%) by 2030.

Options for Consideration: Waste Reduction

1. Nearing the city's 40% recycling diversion goal, Plano should **increase** the diversion goal and increase educational programs and incentives. In addition, Plano **should consider creating mandatory regulations** to increase recycling efforts to remain a recycling leader in North Texas. Mandatory regulations could include providing space within commercial and multifamily dumpster enclosures for recycle refuse containers or converting previously incentivized programs into requirements.

   Pro: Plano may remain a recycling leader in the region and may reduce the amount of landfill waste.

   Con: There may be opposition from the community for mandatory recycling requirements.

Options Continued on Next Page

2. **<u>Recommended policy -</u> Nearing the city's 40% recycling diversion goal, Plano should increase the diversion goal and increase educational programs and incentives without adding new mandatory regulations.**

   <u>Pro</u>: There may be less opposition from the community if recycling efforts were optional.

   <u>Con</u>: Raising the recycling diversion goal may require mandatory regulations to increase the amount of waste recycled to reach the goal.

3. Plano should **maintain** the 40% recycling diversion goal and **not increase** recycling efforts (education, incentives, or mandatory regulations).

   <u>Pro</u>: This may not require any additional labor from city staff or additional funding for incentives.

   <u>Con</u>: Plano may no longer lead the regional recycling efforts as there would be less encouragement to recycle.

AIR QUALITY

Current Comprehensive Plan Strategies

- Monitor federal legislation regarding air quality through regional efforts with the NCTCOG.
- Evaluate alternative transportation options for the Metroplex along with other cities and counties in the region to improve air quality.
- Offer incentives to local major employers to participate in Transportation Demand Management (TDM).
- Identify businesses that can function effectively on non-traditional work hours and encourage them to use flexible scheduling.
- Pursue DART subsides for the purchase of vehicles for van pooling and establish a program to link prospective riders living and working in common geographic areas together. Provide incentives for persons to volunteer as van pool drivers.
- Provide media exposure and award programs for companies that participate in TDM measures.
- Develop public/private partnership with major employers to encourage participation in TDM programs.
- Work with employees to develop transportation management programs that include telecommuting as a means of reducing single occupant vehicular trips to and from work.
- Establish a cost-effective program for replacing city vehicles with those that operate on alternative fuels.

Plano Tomorrow Regionalism P&Z Direction from March 3rd Work Session

- Regional Transportation – Expand roadway, bicycle, and mass transit systems.
- Air Quality – Become a regional leader in terms of local policies to address air quality.

As discussed at the Planning and Zoning Commission's March 3rd Plano Tomorrow work session, air quality is a major concern in the North Texas region. The State of Texas emits more carbon dioxide into the atmosphere than any other state in the US. Texas' high carbon dioxide output and large energy consumption is primarily a result of large coal-burning power plants and automobiles. Addressing several of the topics discussed in this report will assist Plano in reducing its carbon pollution to improve air quality. These topics include: improving building efficiency, investing in clean energy, reducing automobile emissions, and addressing urban heat islands.

Plano is located in the Environmental Protection Agency's (EPA) moderate nonattainment area for 8-hour ozone levels. Ozone forms when nitrogen oxides (NOx) and/or volatile organic compounds (VOCs) combine with sunlight and intense heat.

Primary emissions sources include:

- On-road vehicles (cars, trucks and buses)
- Off-road vehicles (construction equipment, lawn equipment, aircraft and locomotives)
- Point sources (cement and power plants)
- Area sources (oil and gas drilling, bakeries, paint shops and dry cleaners)
- Biogenic sources (vegetation and forest fires)

High ozone concentrations can cause health problems and is especially dangerous for people who have asthma or respiratory problems. Plano has identified a number of transportation actions that can improve air quality including:

- Use mass transit like DART, The T, DCTA, or TAPS
- Carpool or vanpool
- Limit or avoid idling
- Obey the speed limit
- Bicycle or walk instead of drive
- Consider clean fuels and technology
- Report smoking vehicles
- Maintain vehicles by getting them inspected, keeping tires properly inflated and changing filters regularly

Much of the transportation discussion regarding roadways, bicycle facilities, rail, and bus will be presented during the transportation work session scheduled for this summer. However, the discussion of Transportation Demand Management initiatives and city fleet are presented on the following two pages.

AIR QUALITY | TRANSPORTATION | TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) markets alternative forms of transportation to North Texas commuters. TDM efforts are being implemented in urban areas across the country and in DFW in order to reduce traffic congestion and air pollution as well as increase efficiency of the transportation system. Examples of TDM initiatives include:

- Carpooling/vanpooling
- Transit
- Telecommuting
- Compressed work weeks
- Staggered work hours
- Transportation Management Associations
- Park-and-Ride facilities
- Bicycle and pedestrian transportation

There are a number of TDM policies identified in the current comprehensive plan (see page 8 for list); however, none of these policies are actively being addressed today. The city does provide a 50% discount on the purchase of a Monthly DART Transit Day Pass to city employees, which began last year.

TDM Policy Options on Following Page

Options for Consideration: Air Quality | Transportation | TDM

1. **Recommended policy - Plano should commit to a TDM program and meet with local corporations to identify the best policies for the program. Plano should actively pursue corporations to take advantage of the program.**

   Pro: This may ensure that the city and business community determine the most effective policies for a program.

   Con: Additional staff time may be required to conduct meetings with the business community and potential financial cost for incentives.

2. Plano should readopt the existing TDM policies as they address all the needs of our local corporations and businesses. Plano **should not actively pursue** corporations to take advantage of the program.

   Pro: No additional staff time would be required to conduct meetings with the business community.

   Con: The existing policies may not have been effective for the business community.

3. Plano **should remove all TDM policies** from the comprehensive plan as they are not effective.

   Pro: This could ensure the comprehensive plan does not include ineffective policies.

   Con: There may be effective TDM policies that have not yet been pursued, which would help reduce traffic and air pollution.

AIR QUALITY | TRANSPORTATION | CITY FLEET

On October 13, 2005, the North Central Texas Council of Government's Regional Transportation Council (RTC) approved a resolution in support of a Clean Fleet Vehicle Policy and Model Ordinance. The RTC recommends adoption of this policy by governmental entities in the nine-county ozone nonattainment region, as it helps ensure that fleet vehicles are as low-emitting as possible to support efforts to improve air quality and attain the federal ozone standard. The City of Plano has adopted the RTC's Clean Fleet Vehicle Policy and Model Ordinance.

The City of Plano's fleet contains approximately 700 vehicles. A vehicle is defined as requiring registration. Of the 700 vehicles, 191 are flex fuel vehicles, 60 are hybrids, and 7 are propane gas vehicles. Flex fuel vehicles (FFVs) are an alternative fuel vehicle with an engine designed to run on more than one fuel. Technology exists to allow ethanol FFVs to run on any mixture of gasoline and ethanol, from pure gasoline up to 100% ethanol. The city's 191 flex fuel vehicles are run on pure gasoline due to the lack of ethanol fuel stations in the city.

In 2012, Plano signed an agreement with ECOtality to participate in the largest rollout of an electric vehicle charging station infrastructure in history. As a result, there were 17 electric vehicle charging stations installed throughout the city. However, the city has not purchased any electric vehicles at this time due to the logistics of the city vehicle operations and the lack of charging stations. Compressed natural gas (CNG) is another alternative fuel source, which the city has not yet pursued due to a lack of infrastructure.

When vehicles are replaced today, they are replaced with flex fuel vehicles.

Options for Consideration: Air Quality | Transportation | City Fleet

1. Plano should make **significant investments** in converting the city's fleet to alternative fuel or electric vehicles.

   Pro: This could accelerate the creation of a healthier community for Plano's residents, businesses, and visitors and sets the example for others to follow.

   Con: There's little infrastructure (alternative fuel and charging stations) at this time and making a significant investment in vehicles would likely require investment in stations and maintenance facilities.

2. **Recommended policy - Plano should only pursue the most cost effective methods to convert the city's fleet to alternative fuel or electric vehicles.**

   Pro: The city could make incremental investments that are cost effective.

   Con: It's unknown if every investment will eventually be more cost effective than the alternative, which could delay implementation of improvements.

3. Plano **should not** pursue converting the city's fleet to alternative fuel or electric vehicles.

   Pro: There's little infrastructure (alternative fuel and charging stations) at this time and making a significant investment in vehicles would likely require investment in stations and maintenance facilities.

   Con: The air quality may continue to decrease for Plano's residents, businesses, and visitors.

AIR QUALITY | URBAN HEAT ISLANDS

Current Comprehensive Plan Strategies

- None

The Urban Heat Island (UHI) Effect is a growing concern in the North Texas region as temperatures rise and more green space is cleared for development. UHIs occur when the temperature in an urban area is several degrees higher than the surrounding rural areas due to human activities and the built environment.

As the less developed area around the city cools at night, the temperature in the city remains high. This is because pavement, buildings, rooftops, and other developments absorb heat during the day. When the sun sets, the heat is released causing daytime temperatures to be maintained at night. According to the Environmental Protection Agency (EPA), elevated temperatures from UHIs, particularly during the summer, can affect a community's environment and quality of life. Impacts of UHIs include:

- Increased energy consumption
- Elevated emissions of air pollutants and greenhouse gases
- Compromised human health and comfort
- Impaired water quality

Solutions to UHIs include:

- Permeable Pavements
- Urban Forestry/Tree Canopy Coverage
- Green Rooftops/Cool Rooftops

AIR QUALITY | URBAN HEAT ISLANDS | PERMEABLE PAVEMENTS

Permeable pavements are more reflective and generally absorb less heat than traditional pavement. They are often interwoven with grass and/or other porous substrate, which limits heat storage during the day time. The city's Zoning Ordinance allows for permeable pavement if it is intended to improve stormwater quality and/or decrease stormwater quantity. In addition, a minimum 100 parking spaces are required to request the use of permeable pavement. The alternative pavement and drainage design shall be subject to approval by the City Engineer as part of a site-specific stormwater master plan. The Zoning Ordinance allows the use of modular porous pavers, Grass-Crete, or porous concrete as the three permeable pavement options.

Options for Consideration: Air Quality | Urban Heat Islands | Permeable Pavements

1. Plano **should require** the use of permeable pavement for new development and redevelopment, where suitable, including municipal properties.

   Pro: This may reduce UHIs and decrease stormwater runoff.

   Con: There may be opposition from the development community due to increased costs.

Options Continued on Next Page

2. **<u>Recommended policy -</u> Plano should further incentivize the use of permeable pavement and consider installing permeable pavement on municipal properties only if it is cost effective. This could include allowing permeable pavement for any developments, regardless of their parking lot size.**

   <u>Pro</u>: This may voluntarily increase the use of permeable pavement in the city.

   <u>Con</u>: It's unknown if the cost of permeable pavement will eventually be more cost effective than asphalt or concrete, which may delay addressing UHIs.

3. Plano **should retain** the existing incentives for the use of permeable pavement and should not install permeable pavement on municipal properties.

   <u>Pro</u>: There may likely be no opposition from the development community since the regulations are voluntary.

   <u>Con</u>: Air quality may continue to decrease for Plano's residents, businesses, and visitors.

AIR QUALITY | URBAN HEAT ISLANDS | URBAN FORESTRY

Trees and other plants help cool the environment, making vegetation a simple and effective way to reduce urban heat islands (UHIs). Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Evapotranspiration is the sum of evaporation and plant transpiration from the Earth's land and Ocean surface to the atmosphere. The use of trees and vegetation in the urban environment brings benefits beyond mitigating UHIs including:

- <u>Reduced energy use</u>: Trees and vegetation that directly shade buildings decrease demand for air conditioning.
- <u>Improved air quality and lower greenhouse gas emissions</u>: By reducing energy demand, trees and vegetation decrease the production of associated air pollution and greenhouse gas emissions. They also remove air pollutants and store and sequester carbon dioxide.
- <u>Enhanced stormwater management and water quality</u>: Vegetation reduces runoff and improves water quality by absorbing and filtering rainwater.
- <u>Reduced pavement maintenance</u>: Tree shade can slow deterioration of street pavement, decreasing the amount of maintenance needed.
- <u>Improved quality of life</u>: Trees and vegetation provide aesthetic value, habitat for many species, and can reduce noise.

American Forests, a nationwide nonprofit conservation organization, set a minimum goal of 30-35% canopy coverage nation-wide for all cities to aspire to achieve. Several cities in Texas have conducted citywide studies to determine their canopy coverage including Southlake (43% coverage), San Antonio (38% coverage), Dallas (30% coverage), Houston (28% coverage), Mesquite (24% coverage), Denton (18% coverage), and McKinney (17% coverage). Plano has

not conducted a citywide study, but has surveyed its medians and parks, which equated to approximately 25% coverage citywide.

Options for Consideration: Air Quality | Urban Heat Islands | Urban Forestry

1. **Recommended policy - Plano should expand its Urban Forestry initiatives by leading a city-wide tree inventory study to determine the total canopy coverage, species, and long-term health of Plano's urban forest. The City would focus tree planting efforts, maintenance of existing trees, and education to areas of the city where UHI effect is greatest. Existing developments should be required to add landscaping only for significant redevelopment or expansion projects to bring the site into conformance with the Zoning Ordinance's landscaping requirements. Education on the benefits of trees and urban forests should be provided to the citizens.**

   Pro: The City would know where the problem areas are and then focus efforts to actively reduce the UHI. Non-conforming sites may also be actively addressed in terms of landscaping requirements during redevelopment or expansion.

   Con: Additional funding to support a canopy coverage study may be required. In addition, there may be opposition from the development community due to increased costs if significant redevelopment projects are required to come into conformance.

2. Plano **should inform and educate** citizens on the benefits of trees and urban forests, especially relating to UHIs. No additional funding should be spent on a canopy coverage study. All existing developments should be **encouraged** to add landscaping for redevelopment or expansion projects. Plano should continue to actively increase the canopy coverage of parks, municipal sites, and parkways.

   Pro: There would be minimal cost for Urban Forestry initiatives.

   Con: There would be minimal impact to the UHI issue. In addition, problem areas would not be determined without a canopy coverage study.

3. Plano **should not** invest staff time or funding for Urban Forestry initiatives.

   Pro: There would be no cost towards Urban Forestry initiatives.

   Con: Plano's air quality may continue to decrease and the UHI could continue to increase for Plano's residents, businesses, and visitors.

AIR QUALITY | URBAN HEAT ISLANDS | GREEN ROOFS/COOL ROOFS

Green rooftops are rooftops with a layer of vegetation designed to prevent the absorption of heat. Similar to Urban Forestry, green rooftops reduce ambient temperatures through shading and evapotranspiration. Cool rooftops are similar to green rooftops without the vegetation and are designed to reflect more sunlight and absorb less heat than a standard roof. The city provides the option of installing a green or cool roof as part of a building permit; however, this is not a requirement of the 2012 IECC.

Options for Consideration: Air Quality | Urban Heat Islands | Green Roofs/Cool Roofs

1. Plano **should require** cool or green roofing materials for both residential and nonresidential developments, including retrofitting municipal building roofs at the end of their lifespan.

   Pro: This may reduce urban heat islands, improve air quality, and conserve energy.

   Con: There may be opposition from the development community and additional costs for the city.

2. **Recommended policy - Plano should only retrofit municipal building roofs with cool or green roofs at the end of their lifespan if it is cost efficient and incentivize developers to incorporate cool or green roofing materials on residential and nonresidential developments.**

   Pro: This may voluntarily increase cool and green roofs in the city and make progress in reducing urban heat islands.

   Con: This could still be an additional cost for the city and may not have as big of an impact.

3. Plano **should only encourage** developers to incorporate coo or greenl roofing materials on residential and nonresidential developments and should not retrofit any municipal buildings.

   Pro: There may be little or no opposition from the development community since the regulations are voluntary.

   Con: Plano's air quality may continue to decrease and the heat island could continue to increase for Plano's residents, businesses, and visitors.

STORMWATER MANAGEMENT

Current Comprehensive Plan Strategies

- Implement the city's stormwater management plan, monitor its effectiveness and refine as needed.
- Develop and implement a planned maintenance schedule with a one to two year horizon for upgrading and maintaining the water, sewer, and stormwater system.
- Provide annual reports of Plano's stormwater management to the regulating authorities.
- Continue participation in the development and implementation of NCTCOG's Integrated Stormwater Manual.
- Protect creeks, public and private property from the consequences of excess storm water runoff.
- Meet the goals and objectives of Plano's storm water management plan.

Stormwater pollution, also called non-point source pollution, is the contamination of our nation's waters caused by rainfall runoff moving across the land and impervious surfaces. Urbanization leads to an increase in impervious surfaces such as rooftops, parking lots, and roads. As stormwater runoff flows over surfaces, it picks up and carries away pollutants that accumulate during dry periods, finally depositing them into lakes, rivers, and wetlands. The runoff from impervious surfaces and urbanized areas normally contains pollutants such as fertilizers, pesticides, fuels, oil, metals, floating debris and dirt that can significantly impact the quality of receiving waters. Several items previously discussed can improve stormwater quality such as permeable pavements, urban forestry, and green roofs.

Plano received a stormwater permit with the Environmental Protection Agency (EPA) in 2000. The permit's intent was to require cities to implement programs which will help minimize pollution from entering the water ways in the city. The permit allows the city to discharge storm water runoff that is collected in the city's storm drain system into the streams and rivers of the U.S. and the State of Texas. Properties within the city that are developed and ultimately discharge into the city's storm drain system create the non-point source pollution that is a potential problem. In 2007, the Texas Commission on Environmental Quality (TCEQ) took over enforcement of the stormwater program.

Currently, the city does not mandate the pre-treatment of stormwater, it only encourages pretreatment through incentives in certain residential zoning districts such as reduced minimum lot area, lot width/depth and setbacks, and increased allowable lot coverage in some districts. However, since the incentives are not actively pursued, the city must implement a plan to develop, implement and enforce controls to minimize the discharge of pollutants in order to meet requirements of its EPA stormwater permit. The city is currently developing the design criteria and a stormwater quality ordinance, which should take effect in early 2015.

The city also provides educational information to residents and businesses about stormwater pollution and offers a free chemical collection center and a chemical reuse center to assist in disposing hazardous wastes. The stormwater marking program, a program managed by the

Sustainability and Environmental Education Division, assists in educating the public about disposing hazardous wastes by placing markers on storm drains. The city also monitors the water ways for pollution, conducts street sweeps to remove trash, dirt, and other potential pollutants from the street, and monitors sanitary sewer off flow though the Public Works Infiltration Program.

In terms of managing pollution from run off, North Central Texas Council of Governments (NCTCOG) has developed the Integrated Stormwater Management (iSWM) Manual, which identifies the Best Management Practices (BMPs) to design, implement, and evaluate stormwater management efforts in the North Texas region. These stormwater practices include, but are not limited to:

- Bioretention cells
- Organic filter
- Planter boxes
- Sand filters
- Stormwater ponds
- Rain harvesting (tanks/barrels)
- Proprietary structural controls
- Inlet protection devices
- Permeable pavement
- Permeable pavers

Options for Consideration: Stormwater Management

1. Plano **should revise** existing stormwater quality standards and increase **mandatory** standards above the minimum state and federal requirements. This would include incorporating all or some of NCTCOG's Best Management Practices (BMPs) to new developments and significant redevelopment projects. The city should incorporate **all or some** of NCTCOG's BMPs to improve water quality on municipal owned sites, parkways, and roadway projects.

   Pro: This may improve water quality and water runoff in addition to meeting the EPA's stormwater permit requirements.

   Con: There may be opposition from the development community and additional costs for the city.

2. **Recommended policy - Plano should only incorporate the most cost effective practices from NCTCOG's BMPs to improve water quality on municipal owned sites parkways, and roadway projects and should increase incentives for private development and redevelopment projects.**

   Pro: There may be less opposition from the development community if the NCTCOG's BMPs were not mandatory.

   Con: This may still be an additional cost for the city and EPA's stormwater permit requirements may not be met.

Options Continued on Next Page

3. Plano should **only encourage developers** to incorporate NCTCOG's BMPs and **should not** retrofit any municipal sites.

   Pro: There may be little or no opposition from the development community since the stormwater policies are voluntary.

   Con: The city's water quality may continue to decrease and EPA's stormwater permit requirements may not be met.

OPEN SPACE AND NATURAL RESOURCE PRESERVATION

Current Comprehensive Plan Strategies

- Continue efforts to develop Oak Point Nature Preserve in northeast Plano along Rowlett Creek.
- Provide open spaces, trails, and other facilities that support informal activities.
- Restore, maintain, and monitor conserved natural lands to increase national resource resilience, adaptability, and biological integrity.
- Provide for relief from the built environment through the acquisition and maintenance of open areas and natural settings.

The Zoning Ordinance defines open space as an area included in any side, rear, or front yard or any unoccupied space on a lot that is open and unobstructed to the sky except for the ordinary projections of cornices, eaves, or porches. Useable open space is intended to provide outdoor living and/or recreation in an open area or recreation facility. One of the most reoccurring responses on the Plano Tomorrow Public Outreach Campaign Survey was the desire to preserve Plano's two nature preserves, Oak Point and Arbor Hills. As Plano continues to urbanize, dedicating open space and preserving natural resources is important for the environment, citizen health, and biological existence. Land is limited and Plano will need to grow its open space inventory strategically to continue to provide for a growing community. For example, unbuildable floodplains provide a unique opportunity for the city to construct trails to connect existing parks and other places of interest. As Plano's population continues to grow, it will be important to identify any areas where open space can be expanded.

Options for Consideration: Open Space and Natural Resource Preservation

1. **Recommended policy - Plano should pursue additional open space and trail connections to improve the quality of life for its citizens. This would include purchasing vacant and underutilized land for parks and open space and/or purchasing floodplain for trail connections.**

   Pro: This may accelerate the creation of a healthier community that would accommodate Plano's growing population.

   Con: This may include acquisition costs associated with purchasing additional land or easements.

2. Plano should continue efforts to develop and enhance existing open spaces and preserves **but should not consider expanding** its open space inventory as the city's population increases.

   Pro: The city may still continue to enhance the existing open spaces and preserves.

   Con: It is unknown if the amount of existing open space is adequate for Plano's growing population.

Options Continued on Next Page

3. Plano **should not spend any additional resources** on open spaces or preserves.

   Pro: There would be no additional funding spent on open spaces or preserves.

   Con: This may discourage residents from enjoying open spaces or preserves if they are crowded or not well-maintained.