# 2040 Growth Scenarios Analysis

October, 2010

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# 1. Introduction and Executive Summary

## Purpose

The purpose of this report is to assess a range of future development options for Lincoln and Lancaster County with regard to impacts on land consumption, infrastructure costs, community services, and the environment. The emphasis is on planning elements that are affected by the type and direction of growth. The analysis that follows was completed to evaluate each of the scenarios relative to six major planning components that embody a range of reporting elements. It identifies the pros and cons, issues, impacts, and - where practical - the relative costs of each of the three scenarios relative to each major planning component. **For the purposes of comparing scenarios, no inflation is added; costs are in 2009 dollars.** By necessity, the analysis is speculative in many ways, due to the unknowns of the long term future as it relates to global economics, technological progress, lifestyle preferences, and other issues. This is reflected in the varied and sometimes even conflicting comments from departments and agencies.

The results of the analysis, together with input from the public and LPlan 2040 Advisory Committee, will be utilized to develop a single scenario. The selected growth scenario may include elements from more than one of the alternatives evaluated, and may be further refined by input from the community discussion. Subsequently, the selected growth scenario will form the basis for developing a draft future land use plan that will be available for more detailed analysis and transportation modeling.

## Growth Scenarios

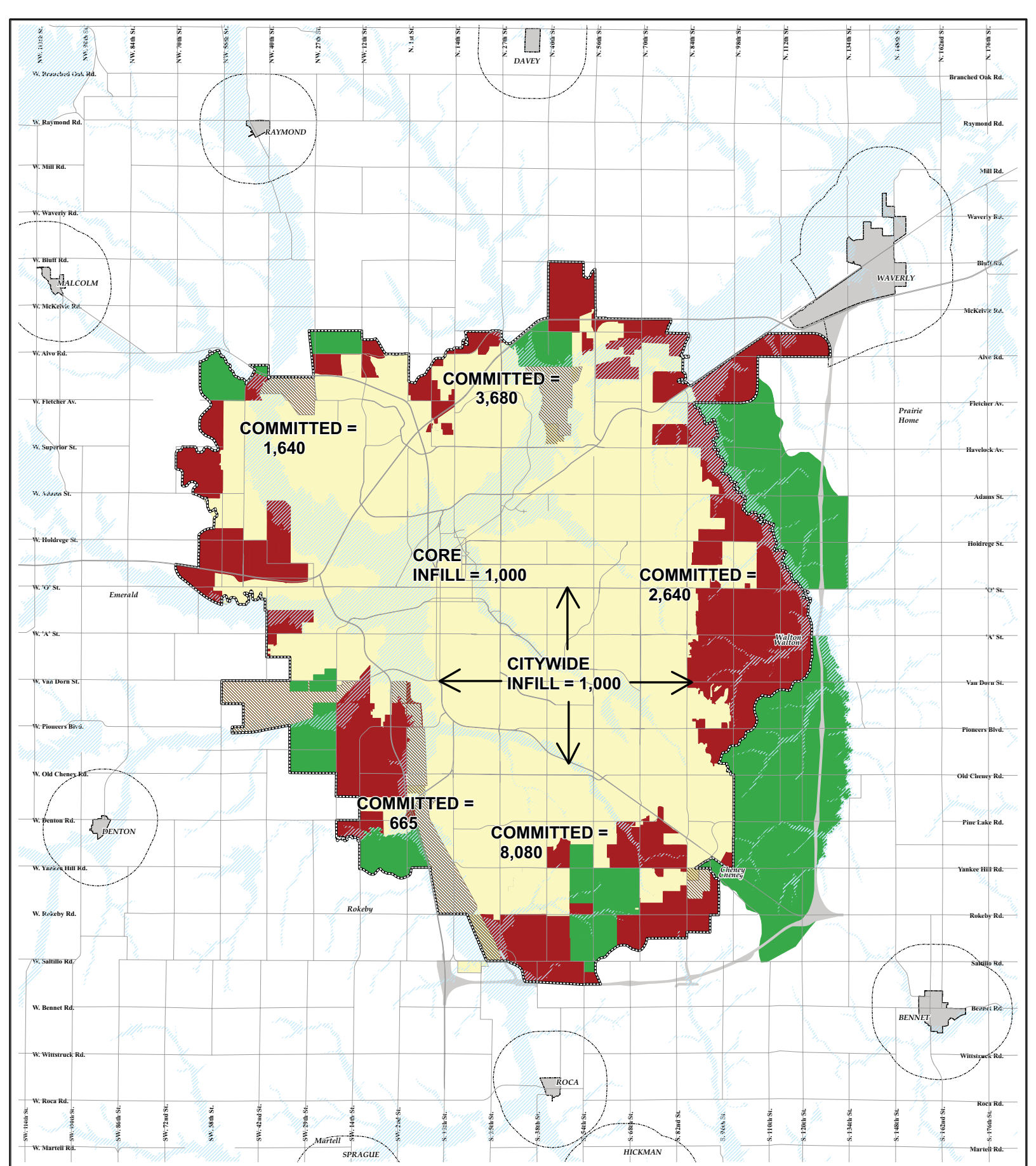
Three different growth scenarios were evaluated to offer distinct alternatives for consideration regarding the type and direction of growth in Lincoln and Lancaster County to the year 2040 (Tier I) and 2060 (Tier II). These included "A - Multi-Directional Growth," "B - Stevens Creek Growth," and "C - Compact Growth." The majority of planning elements are analyzed relative to the 2040 planning period. Certain reporting elements are additionally evaluated with respect to the 2060 planning period (such as urban water and sewer services), and are so noted. There are several fundamental assumptions that applied to all three scenarios:

- Two tiers of growth are identified: Tier I (red area) represents the future growth area to the year 2040; Tier II (green area) represents the future growth area from 2040 to 2060
- By 2040, the Lancaster County population will increase by 126,000 people; from 2040 to 2060, an additional 100,000 people will be added
- 90% of the population in 2040 will be in Lincoln, 6% will be in the rural part of the County and 4% in small towns
- Lincoln's population will need another 47,500 residential units in 2040; 4,500 residential units will be needed in the remaining portion of Lancaster County
- Under each scenario, urban residential lots already approved (the equivalent of 16,000 dwelling units) are assumed to be used for new housing
- Approximately 6 square miles of land in Tier I are included for future employment growth

- ❖ The City of Lincoln will continue to implement policies of growth based upon drainage basins with gravity-flow sewer and new development that is contiguous to the existing City limits
- ❖ Urban residential land area to accommodate 125% of the projected demand is included to allow for choice
- ❖ Rural acreage development is generally shown outside of the Tier I and Tier II urban growth areas
- ❖ Low density acreage development that is built, platted, or zoned continues to be shown for acreage development in the future, but other land designated for acreages is located based upon a suitability index, not on what is shown in the 2030 Plan

Beyond these common assumptions, each of the scenarios was distinguished by direction and type of growth as shown on the following table and maps for the City and County:

| A. Multi-Directional Growth | B. Stevens Creek Growth | C. Compact Growth |
|---|---|---|
| • Future growth demands met in multiple directions<br>• Approximately 26 square miles of land added to urban area in Tier I<br>• New housing will continue trend of 70% single family and 30% multi-family<br>• 96% of new housing will be located on the edges with 2,000 infill units in the Downtown Core and throughout the community<br>• Continue trend of 3 residential units per gross acre density for new urban development<br>• Rural acreage development in multiple directions, including existing platted lots and cluster developments<br>• Approximately 9 additional square miles of rural land area in the unincorporated county is identified to satisfy next 50 years of demand for acreages | • Emphasizes growth to east in Stevens Creek watershed and south of existing city<br>• Approximately 26 square miles of land added to urban area in Tier I<br>• Southwest area of current plan no longer identified as a growth area<br>• New housing will continue trend of 70% single family and 30% multi-family<br>• 96% of new housing will be located on the edges with 2,000 infill units in Downtown Core and throughout community<br>• Continue trend of 3 residential units per gross acre density for new urban development<br>• Rural acreage development to the east and south, including existing platted lots and cluster developments<br>• Approximately 9 additional square miles of rural land area in the unincorporated county is identified to satisfy next 50 years of demand for acreages | • Emphasizes more compact growth with $^{1}/_{3}$ of future residential demand met within existing city and $^{2}/_{3}$ on edges of community<br>• Approximately 14 square miles of land added to urban area in Tier I<br>• Southwest area of current plan only identified for small amount of long-term growth (beyond 2040)<br>• Future split of new housing unit types is 50% single family and 50% multi-family<br>• 64% of new housing will be located on the edges with 7,500 infill units in Downtown Core area and 9,500 infill units in other commercial nodes and corridors of city<br>• Higher density of 4 residential units per gross acre for new urban edge development<br>• Rural acreage development in existing platted lots, cluster developments, and within small town jurisdictions<br>• Approximately 9 square miles of rural land area to satisfy next 50 years of demand for acreages is accommodated within small town jurisdictions |




# URBAN GROWTH SCENARIO A - MULTI DIRECTIONAL

- Public Land Not Available for Development
- Floodplain and Flood Prone Areas
- Lincoln City Limits and Committed Land
- Lincoln Future Service Limit (2030 Plan)
- Tier I (2040)
- Tier II (2060)

| Tier | Acres | Square Miles (Outside of Floodplain) |
|---|---|---|
| Tier I (2040) | 16,649.6 | 26.01 |
| Tier II (2060) | 14,308.6 | 22.35 |

N

0 0.5 1 2 Miles

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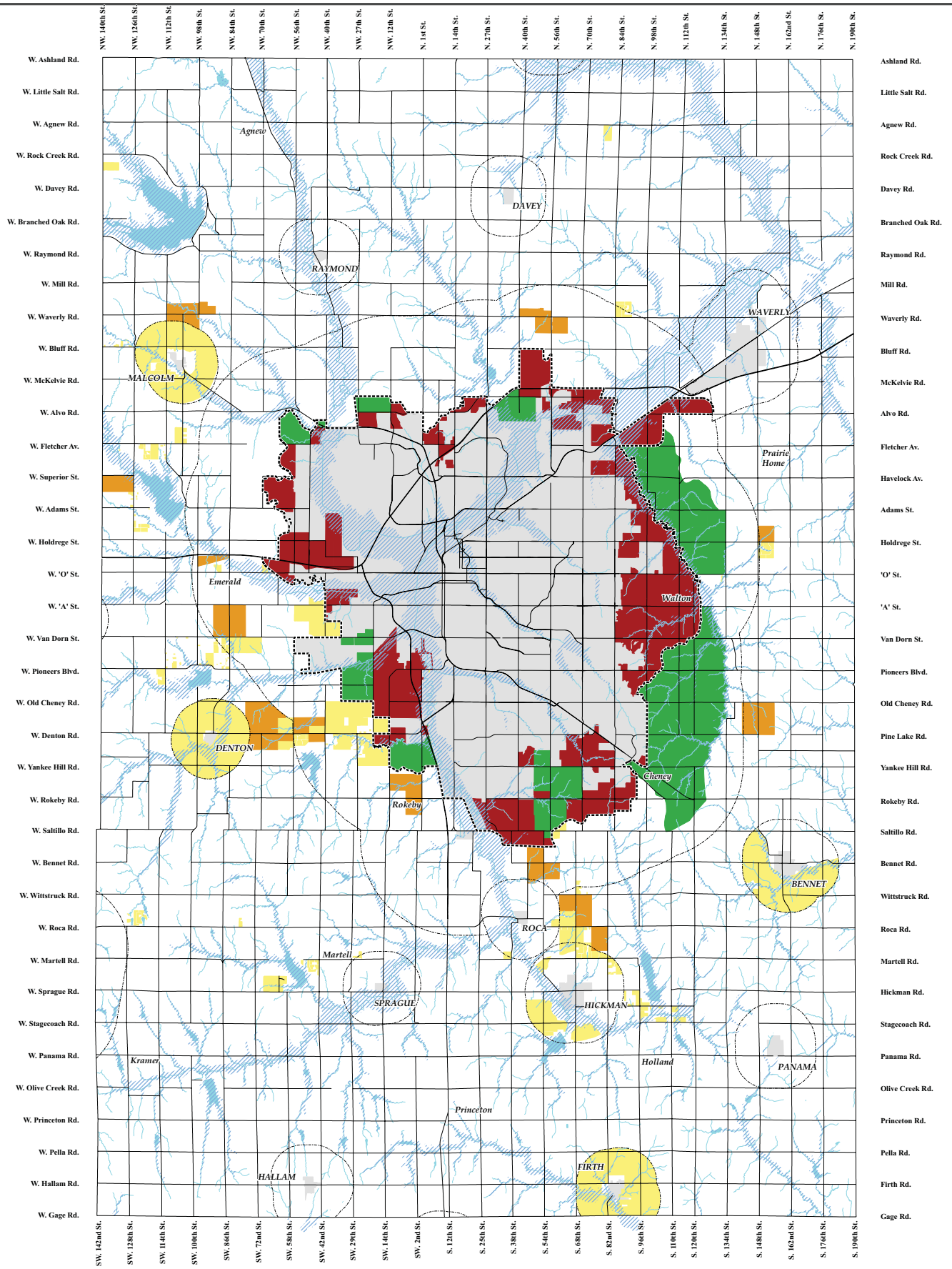
August 24, 2010




# LANCASTER COUNTY GROWTH SCENARIO: A - MULTI DIRECTIONAL

**Note:** *The majority of acreage development does not occur in areas shown above in yellow or orange. 70% to 80% of acreage development occurs in the agricultural area and that pattern is expected to continue by using techniques such as farmstead splits, AG clusters, 20 acre parcels and existing grandfathered lots.*

- Low Density Acreage Development that is Built, Platted, or Zoned
- Lakes & Streams
- Floodplain/Floodprone
- Lincoln City Limits, Committed Land, Incorporated Towns, and Land Not Available for Development
- Future Service Limit (2030 Plan)
- Tier I (2040) 16,649.6 Acres/26.01 Sq Mi (Outside of Floodplain)
- Tier II (2060) 14,308.6 Acres/22.35 Sq Mi (Outside of Floodplain)
- Proposed Additional Low Density Acreage Development: 5,775 Acres/9.02 Sq Mi

N

Miles 0 0.5 1 2 3

LPlan 2040

LINCOLN - LANCASTER COUNTY PLANNING DEPARTMENT

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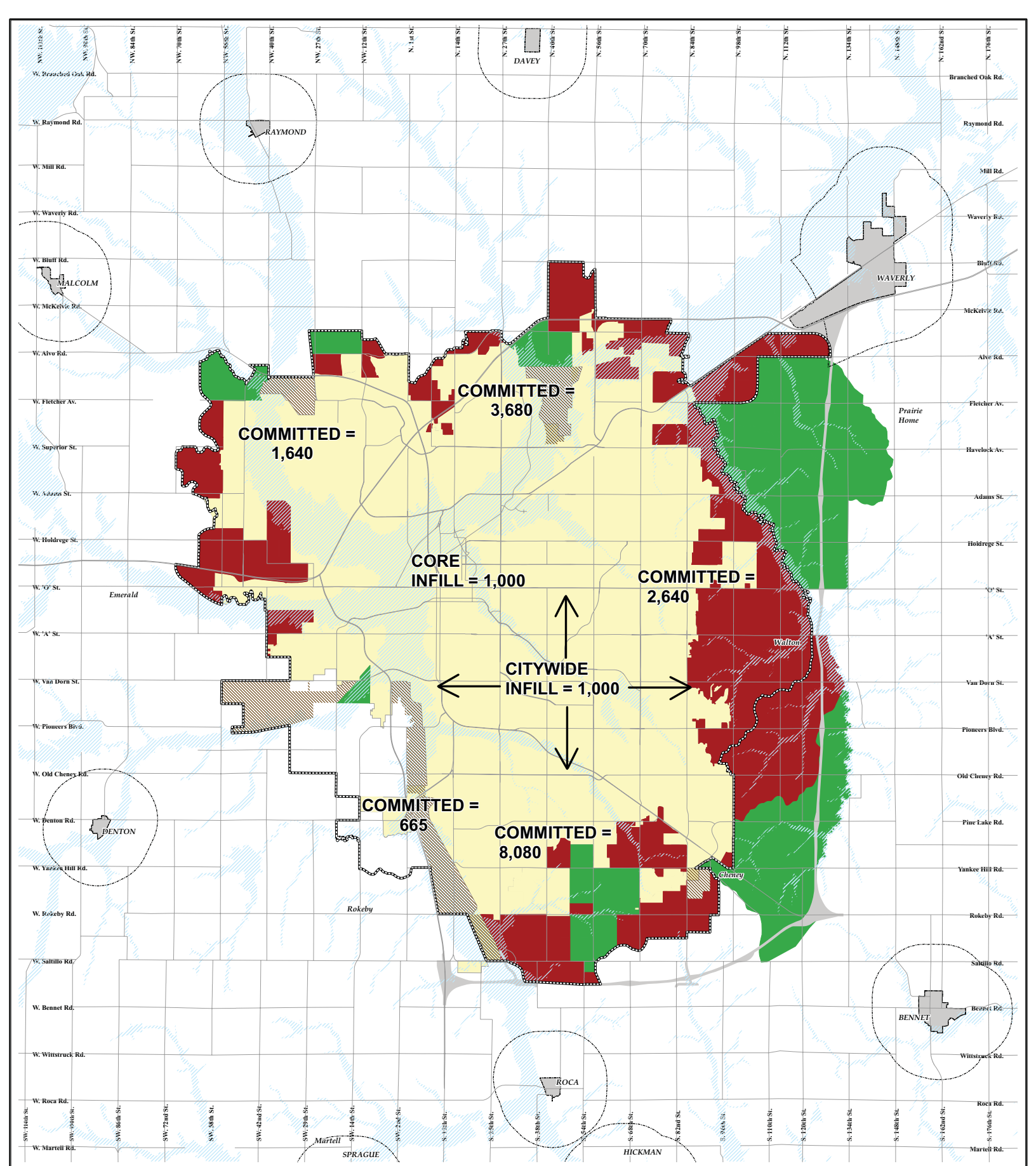
September 1, 2010




# URBAN GROWTH SCENARIO B - STEVENS CREEK

- Public Land Not Available for Development
- Floodplain and Flood Prone Areas
- Lincoln City Limits and Committed Land
- Lincoln Future Service Limit (2030 Plan)
- Tier I (2040)
- Tier II (2060)

| Tier | Acres | Square Miles (Outside of Floodplain) |
|---|---|---|
| Tier I (2040) | 16,775.2 | 26.21 |
| Tier II (2060) | 14,021.3 | 21.90 |

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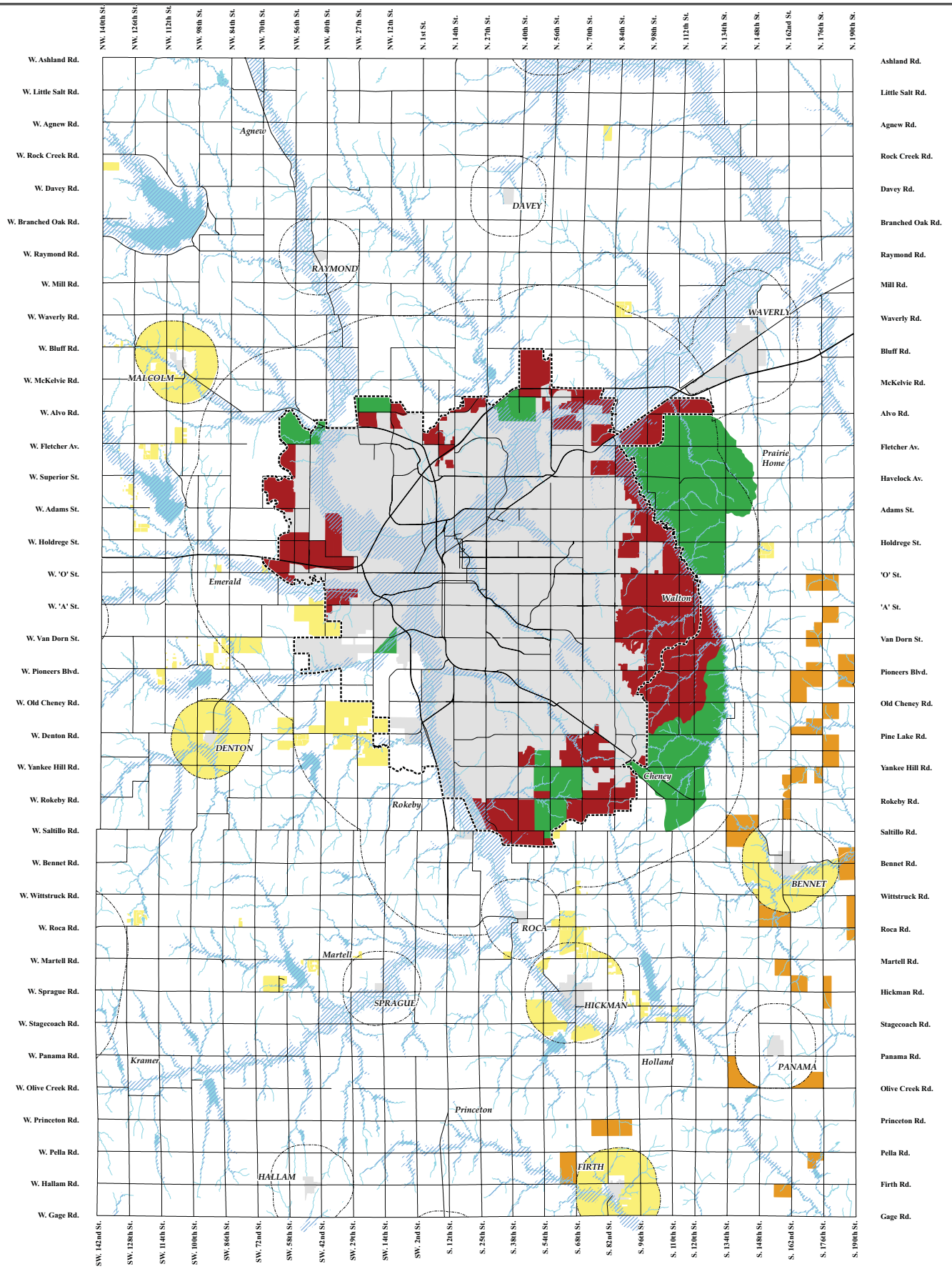
August 24, 2010




# LANCASTER COUNTY GROWTH SCENARIO: B - STEVENS CREEK

**Note:** *The majority of acreage development does not occur in areas shown above in yellow or orange. 70% to 80% of acreage development occurs in the agricultural area and that pattern is expected to continue by using techniques such as farmstead splits, AG clusters, 20 acre parcels and existing grandfathered lots.*

- Low Density Acreage Development that is Built, Platted, or Zoned
- Lakes & Streams
- Floodplain/Floodprone
- Lincoln City Limits, Committed Land, Incorporated Towns, and Land Not Available for Development
- Future Service Limit (2030 Plan)
- Tier I (2040) 16,177.3 Acres/25.27 Sq Mi (Outside of Floodplain)
- Tier II (2060) 14,021.3 Acres/21.90 Sq Mi (Outside of Floodplain)
- Proposed Additional Low Density Acreage Development: 5,824 Acres/9.10 Sq Mi

Miles: 0 0.5 1 2 3

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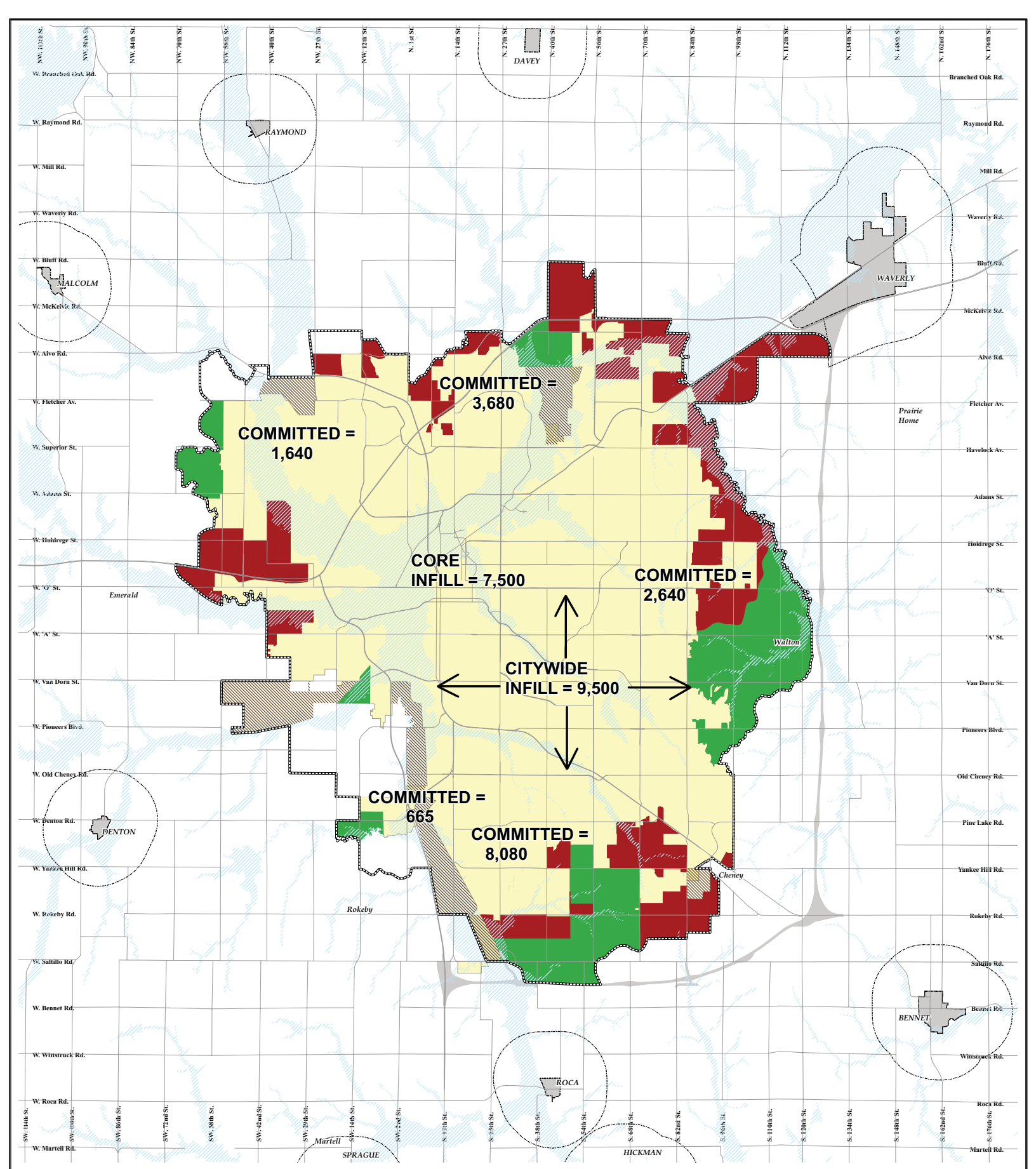


# URBAN GROWTH SCENARIO C - COMPACT

- Public Land Not Available for Development
- Floodplain and Flood Prone Areas
- Lincoln City Limits and Committed Land
- Lincoln Future Service Limit (2030 Plan)
- Tier I (2040)
- Tier II (2060)

| Tier | Acres | Square Miles (Outside of Floodplain) |
|---|---|---|
| Tier I (2040) | 8,904.5 | 13.91 |
| Tier II (2060) | 7.408.4 | 11.57 |

0 0.5 1 2 Miles

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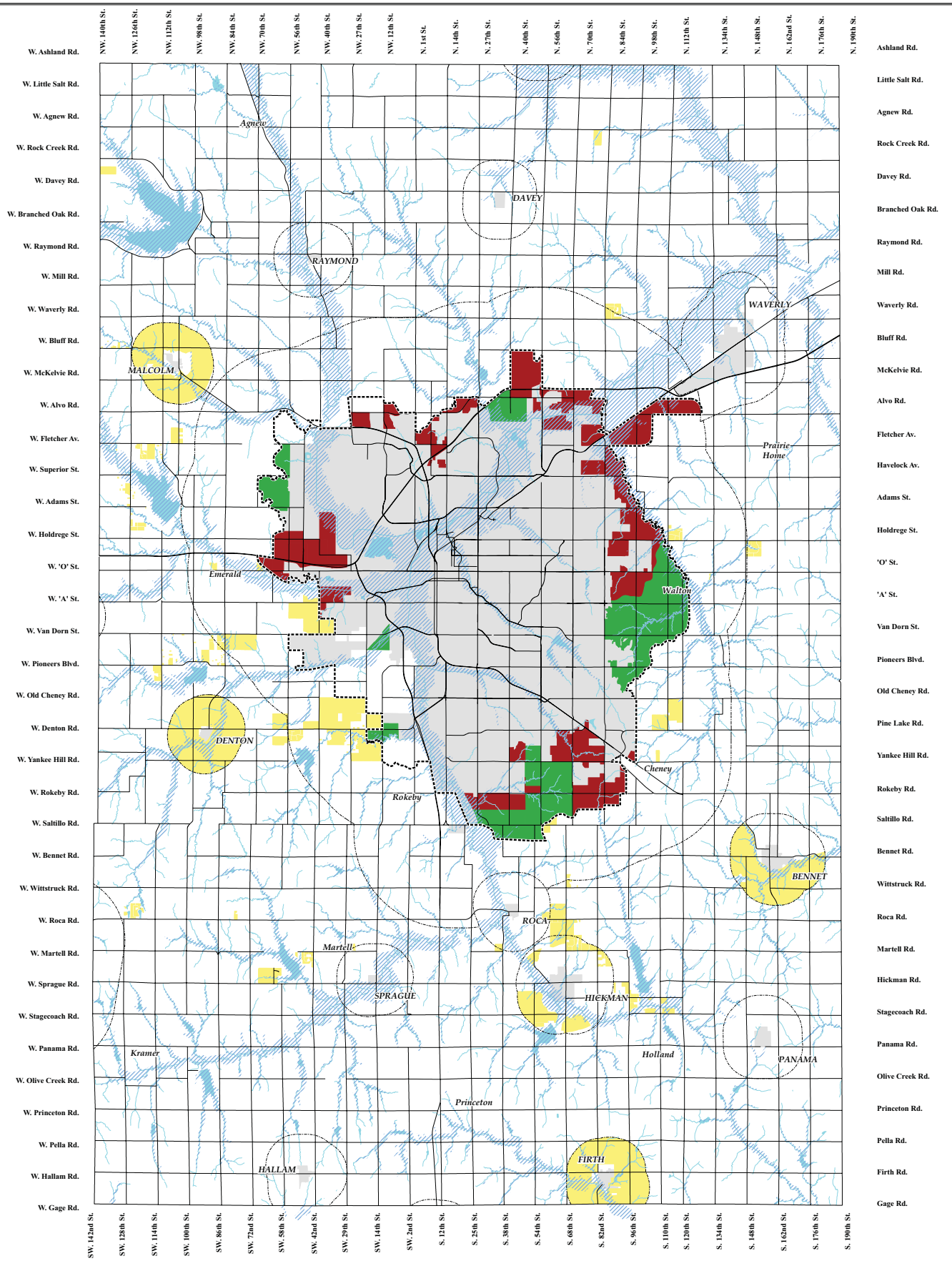


# LANCASTER COUNTY GROWTH SCENARIO: C - COMPACT

**Note:** *The majority of acreage development does not occur in areas shown above in yellow or orange. 70% to 80% of acreage development occurs in the agricultural area and that pattern is expected to continue by using techniques such as farmstead splits, AG clusters, 20 acre parcels and existing grandfathered lots.*

- Low Density Acreage Development that is Built, Platted, or Zoned
- Lakes & Streams
- Floodplain/Floodprone
- Lincoln City Limits, Committed Land, Incorporated Towns, and Public Land Not Available for Development
- Future Service Limit (2030 Plan)
- Tier I (2040) 8,904.5 Acres/13.91 Sq Mi (Outside of Floodplain)
- Tier II (2060) 7,408.4 Acres/11.57 Sq Mi (Outside of Floodplain)

N W E S

0 0.5 1 2 3 Miles

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September 1, 2010

## A. Multi-Directional Growth Scenario

This scenario continues the current policy to provide developable land that has access to urban services in multiple directions. It assumes the City continues to develop at the current density of three residential units per gross acre for new urban development, and that the type and mix of new housing continues a trend of 70% single family and 30% multi-family. Like the 2030 Plan, this scenario assumes approximately 96% of new growth will occur on the fringes of the existing urban area. Approximately 26 square miles of land are added to the urban area in Tier I to meet the projected future demand of the city over the next 30 years.

Rural acreage development occurs in multiple directions outside the urban growth tiers for Lincoln. Consistent with all scenarios, acreage development that is built, platted, or zoned continues to be shown for acreage development in the future. However, other land designated for acreages is located based upon a land suitability rating system in multiple directions in the county, including existing platted lots and cluster developments. Approximately nine additional square miles of rural land area in the unincorporated county is identified to satisfy next 50 years of demand for acreages.

## B. Stevens Creek Growth Scenario

This scenario designates future urban development to the east in the Stevens Creek watershed and in currently identified growth areas to the south of the city. The intent of this scenario is to be able to assess the pros and cons of a more unidirectional growth pattern. Future growth out to 2040 in Stevens Creek is shown mainly in the western half of the watershed. The southern portion of the western half and the northern portion of the east half are identified as Tier II for growth from 2040 to 2060. Areas to the southwest previously shown as Tier I in the 2030 Plan are no longer identified for urban growth in this scenario.

Like the Multi-Directional Growth Scenario, this scenario assumes the City continues to develop at the current density of three residential units per gross acre for new urban development, and that the type and mix of new housing continues a trend of 70% single family and 30% multi-family. This scenario also assumes approximately 96% of new growth will occur on the fringes of the existing urban area. Approximately 26 square miles of land are added to the urban area in Tier I under this scenario.

Rural acreage development occurs in the eastern and southern areas of the county that have better water supplies and water services, outside the urban growth tiers for Lincoln. Consistent with all scenarios, acreage development that is built, platted, or zoned continues to be shown for acreage development in the future. However, other land designated for acreages is located based upon a land suitability rating system in the southern and eastern portions of the county, including existing platted lots and cluster developments. Approximately 9 additional square miles of rural land area in the unincorporated county is identified to satisfy next 50 years of demand for acreages.

## C. Compact Growth Scenario

This scenario designates future urban development inside the existing city limits, and in new areas generally to the east and south of the city. The intent of this scenario is to assess the pros and cons of a more compact growth pattern. With this scenario, a larger amount of the future

projected residential demand is directed inside the existing city limits with a focus on the Downtown core area and in commercial/industrial-zoned nodes and corridors. In addition, new development on the fringes is assumed to develop at a higher density. Areas to the southwest previously shown as Tier I in the 2030 Plan are no longer identified for urban growth in this scenario.

In contrast to the Multi-Directional and Stevens Creek Growth Scenarios, this alternative assumes that future growth demands are met by locating about one third of future residential demand within the existing city and two thirds on the edges of the community. Sixty-four percent of new housing will be located on the edges with 7,500 infill units in the Downtown core area and 9,500 infill units in other commercial nodes and corridors. The type and mix of new housing is 50% single family and 50% multi-family. For new urban development, it is assumed the city develops more densely at four residential units per gross acre. Approximately 14 square miles of land are added to the urban area in Tier I under this scenario.

Rural acreage development occurs in existing rural platted lots, cluster developments, and within small town jurisdictions, consistent with the land use designations for those communities and outside both the Tier I and Tier II growth areas for the city. As in the other scenarios, acreage development that is built, platted, or zoned continues to be shown for acreage development in the future. However, no additional land is designated for acreages within the unincorporated areas of the county. The adopted plans for the small towns presently show approximately 18 square miles designated for acreages, about double what is needed to satisfy the next 50 years of demand in Lancaster County.

This scenario responds to projected changes in population and demographics that predict we will have an aging population and younger generations with smaller families and different housing preferences. By 2040, Lancaster County will more than double the number of people age 65 and older, and only 28% of households will include children under 18 . The projections indicate smaller households, an increased number of single person households and increased preferences for proximity to services over the next 30 years. The compact growth scenario also responds to global and national changes relative to energy and climate change, by providing increased opportunities for other modes of transportation besides the car (walking, biking and transit), and by making efficient use of infrastructure to support growth.

## Pros and Cons Summary Table

***Note: No dollar figure identified in right column where cost estimate is unavailable.**

| | Pros | Cons | $* |
|---|---|---|---|
| **Urban Form** | | | |
| Scenario A | • Most location choice due to multiple directions and land area<br>• Most similar to 2030 Comprehensive Plan (policies already in place)<br>• Continuation of familiar building patterns and housing types<br>• Takes advantage of U.S. Highway 77 | • Cost of new infrastructure and expansion of services over a larger area<br>• Housing types might not meet needs of county's changing demographics<br>• In general, higher operation and maintenance costs than Scenario C<br>• Encroachment into vicinity of high pressure underground pipelines<br>• Walking, biking, and transit options are less viable due to separated land uses and lower densities<br>• Increase in air pollution due to more and longer vehicle trips | |
| Scenario B | • Capitalizes on major infrastructure commitments in Stevens Creek watershed<br>• Less costly than Scenario A<br>• Continuation of familiar building patterns<br>• More growth toward and easier access to Omaha<br>• Takes advantage of East Beltway if constructed<br>• Accommodates nearer-term urban growth for interested landowners in Stevens Creek basin | • Cost of new infrastructure and expansion of services over larger area<br>• Housing types might not meet needs of county's changing demographics<br>• In general, higher operation and maintenance costs than Scenario C<br>• Encroachment into vicinity of high pressure underground pipelines<br>• Walking, biking, and transit options are less viable due to separated land uses and lower densities<br>• May affect landowners with interest in growth areas currently designated in 2030 Plan<br>• Increase in air pollution due to more and longer vehicle trips | |
| Scenario C | • Less costly than Scenarios A and B<br>• More efficient use of infrastructure and provision of services<br>• More funds available for operation and maintenance<br>• Creates more housing choices for changing demographics<br>• Walking, biking, and transit options are more viable<br>• Positive impacts on public health<br>• Preserves more agricultural land and natural resources in county<br>• Less impact on air pollution due to shorter vehicle trip lengths and multiple modes of transportation | • Longer timeline for development near U.S. Highway 77<br>• Higher land costs for development; land assembly challenges<br>• Need to overcome misconceptions about multi-family dwellings and mixed use redevelopment<br>• Challenging to balance predictability for developers with neighborhood concerns<br>• Potential for increased congestion if alternate modes of transportation not effectively implemented<br>• New policies and incentives may need to be created<br>• May affect landowners with interest in growth areas currently designated in 2030 Plan | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Rural Form** | | | |
| **Acreages** | | | |
| Scenario A | • Provides greatest flexibility and choice<br>• Most acreage areas would be supported by existing paved roads<br>• Preferred by Waverly School district | • Acreage development not in area of best water quality and availability<br>• Some acreage areas not on existing paved roads<br>• May result in acreages in vicinity of high pressure underground pipelines | |
| Scenario B | • Rural water service available with potentially better ground water quality<br>• Individual road improvements may have greater benefits due to acreages being more concentrated in eastern/southern areas of county | • Less choice provided than Scenario A<br>• Very few acreage areas are on existing paved roads, will require currently unplanned road improvements | |
| Scenario C | • Compact and least cost for public improvements and services<br>• Very little impact to county roads | • Least flexibility and choice in location of acreages | |
| **Farming** | | | |
| Scenario A | • Spreads out the impact of acreages on farming operations | • Potential for greater number of conflicts with city and rural growth | |
| Scenario B | • Most impact restricted to Stevens Creek Basin while conserving other rural areas for farming operations | • Acreages are more intensely located in the south and east portions of the county with greater impact in those areas | |
| Scenario C | • Least impact on farming operations | • Reduced opportunity for rural land owners to sell land for acreages | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Transportation** | | | |
| **Streets and Highways** | | | |
| Scenario A | • Continues current plan for road improvements; uses existing and planned roadway infrastructure<br>• Acreage development in multiple directions is better suited to use paved County roads | • Second most expensive option for new arterial streets on community's edge<br>• Longer average trip lengths and more vehicle miles traveled (VMT) | $445 M for new edge arterial streets |
| Scenario B | • If designed properly, street improvements in one single area of growth could provide opportunity for heightened bike and pedestrian facilities<br>• Closer proximity to Interstate, future East Beltway and access to Omaha metro area | • Potential increased pressure to build East Beltway (with possible land owner concerns)<br>• Most expensive option for new city and county streets<br>• Longer average trip lengths and more VMT | $452 M for new edge arterial streets |
| Scenario C | • Least expensive option for new streets<br>• Potential for shorter average trip length and fewer VMT<br>• Responds to projections for fewer vehicle trips with changing demographics and technology<br>• Increased viability for walking, biking and transit<br>• Least impact on county road system | • Potential for increased congestion if alternate modes of transportation and other measures to reduce vehicle traffic not implemented | $278 M for new edge arterial streets |
| **Public Transit** | | | |
| Scenario A | • Can continue radial transit network with downtown as main hub of operations | • Limits ability to provide transit service to all areas of city<br>• Underutilizes capacity of existing transit system | |
| Scenario B | | • Diminishes viability of downtown and central Lincoln as hub of services<br>• Likely results in need for second transit hub in Westfield/Gateway area if try to serve entire city<br>• Limits ability to provide service to all areas of city<br>• Underutilizes capacity of existing system | |
| Scenario C | • Most efficient scenario for serving increased population<br>• Likely to increase ridership<br>• Increased viability for new and expanded services | • In order to help change travel habits, may need to invest more into the transit system with additional and improved services to make transit a more attractive travel option | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Pedestrian and Bicycle Facilities** | | | |
| Scenario A | • Allows for continued incremental expansion of trail system in multiple directions<br>• More sidewalk installation with new edge arterial construction | • More expensive alternative for expansion of trail system (28 miles of new trail)<br>• More expensive alternative for sidewalk installation along new arterial streets | $9.2 M for new trails; $14.25 M for new sidewalks |
| Scenario B | • Development of trail system in Stevens Creek area would provide additional trail amenity<br>• Growth concentrated in one area provides opportunity to develop system of on-street bike facilities with new streets<br>• More sidewalk installation with new edge arterial construction | • More expensive alternative for expansion of trail system (28 miles of new trail)<br>• More expensive alternative for sidewalk installation along new arterial streets | $9.2 M for new trails; $14.32 M for new sidewalks |
| Scenario C | • Potential to provide more walkable and bikable neighborhoods<br>• Least expensive alternative for expansion of trail system (13.3 miles of new trail)<br>• Least expensive alternative for sidewalk installation along new arterial streets<br>• Increased viability of effective on-street bike system<br>• Supports options that support healthy living | • Changing travel habits could be challenging | $4.4 M for new trails; $8.98 M for new sidewalks |
| **Energy Use and Emissions Impacts** | | | |
| Scenario A | • Continues existing policies of current Comprehensive Plan<br>• Use of new energy efficient building designs could improve overall energy demand of community | • Second most energy intensive option for transportation<br>• Second-worst alternative for air quality impacts<br>• Greenhouse gas emissions from residences (heating and cooling) higher than Scenario C<br>• Viability of alternative travel modes more limited | |
| Scenario B | • The use of new energy efficient building designs could improve the overall energy demand in the community | • Most energy intensive option for transportation<br>• Worst air quality impacts<br>• Greenhouse gas emissions from residences (heating and cooling) higher than Scenario C<br>• Viability of alternative travel modes more limited | |
| Scenario C | • Most energy efficient relative to transportation<br>• Greenhouse gas emissions from residences (heating and cooling) lower than Scenarios B and C<br>• Lowest air quality impacts<br>• Greatest opportunity for alternative travel modes | • Changing travel habits could be challenging<br>• General acceptance by community of new development options and choices may be challenge<br>• Congestion could increase air pollution unless successful mitigation efforts are applied | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Utilities/Infrastructure** | | | |
| **Water/Rural Water** | | | |
| Scenario A | | • Most costly for Lincoln Water System (LWS) – requires construction of NE loop main through or around city<br>• Greatest loss of service area for rural water districts | **2040**: $134M<br>**2060:** $86M |
| Scenario B | • Existing LWS reserve capacity to the east makes this less expensive than A | • Represents lesser loss of service area for rural water districts | **2040**: $119M<br>**2060:** $77M |
| Scenario C | • Less fire flow required per capita<br>• Lower peak outdoor water use<br>• Least loss of service area to rural water districts | • May require up-sizing of pipes for redeveloping areas. Problematic in areas that are currently residential | **2040**: $81M<br>**2060:** $49M |
| **Wastewater** | | | |
| Scenario A | • Facility improvement schedule for treatment plants would remain similar to current plans | • Highest cost for trunk lines, treatment improvements<br>• Highest increase in O&M costs<br>• Highest rate increases required | **2040**: $710M<br>**2060:** $492M |
| Scenario B | • Projects in one basin and treatment facility<br>• Fewer trunk sewer improvements<br>• Lower O&M , inflow, & rate increases than A<br>• Lower cost for treatment improvements to 2040 due to existing capacity in NE plant | • Increase demand for improvements to NE plant, more wastewater directed there<br>• Increased treatment improvement costs to 2060 make this scenario significantly more expensive than C | **2040**: $418M<br>**2060:** $565M |
| Scenario C | • Least amount of new trunk sewer<br>• Facility improvement schedule for treatment plants would remain similar to current plans<br>• Lowest increased O&M costs & rate increase | • May require some existing pipes be up-sized to accommodate infill | **2040**: $457M<br>**2060:** $208M |
| **Stormwater** | | | |
| Scenario A | • Will not stress smaller existing infill systems<br>• Opportunity for sustainable design in new areas<br>• New systems will not be as costly as many will be private, due to new regulations | • May increase pressure to grow in floodplains<br>• Significantly impacts O&M budget | |
| Scenario B | • See A above | • See A above | |
| Scenario C | • Cost lower if redevelopment does not increase impervious area<br>• Opportunities to de-pave, increase pervious surface areas<br>• Less impact on O&M budget | • If redevelopment increases impervious area in existing city, already stressed systems will need replacement | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Electrical Services** | | | |
| Scenario A | • No significant impact on LES service<br>• Norris/LES Service area boundary affected very little | • Multiple fronts spread construction efforts and increase costs<br>• Growth to the south needs new transmission lines | |
| Scenario B | • Growth on fewer fronts means higher utilization of assets for LES<br>• No significant impact on LES service | • South growth needs new transmission lines<br>• Excessive adjustment of LES/Norris service area boundary | |
| Scenario C | • Norris service area would be least affected by this scenario<br>• Some commercial nodes and corridors may not require up-sizing for redevelopment to residential mixed-use | • Increased density in residential areas in particular would require upsizing.<br>• O&M increase due to high loads on old lines | |
| **Natural Gas** | | | |
| Scenario A | • Black Hills currently fortifying gas pressure in west Lincoln | • Limited infrastructure in place, potentially higher initial costs to serve | |
| Scenario B | • East supplied with 3 mains, high pressure most available in this scenario | • Possible environmental or other requirements hinder development in Stevens Creek | |
| Scenario C | • Least amount of new infrastructure with this scenario | | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Natural Resources and Environment** | | | |
| **Water Quality, Wetlands and Watershed/Floodplain** | | | |
| Scenario A | • If development is done sustainably, impacts can be kept to manageable level<br>• New growth areas provide opportunities for sustainable development that avoids, minimizes and mitigates wetland impacts | • Higher density of wetlands in this area<br>• Difficult to track extent and severity of degradation and focus on mitigation when growth is on multiple fronts<br>• Potential for more encroachment of urban area into riparian corridors and floodplains causing destabilization<br>• Greatest potential for water quality impacts<br>• Most growth into potential environmental/ natural resources, e.g., Little Salt Creek. | |
| Scenario B | • If development is done sustainably, impacts can be kept to manageable level<br>• New growth areas provide opportunities for sustainable development that avoids, minimizes and mitigates wetland impacts<br>• Better able to focus mitigation efforts in fewer basins | • Potential for more encroachment of urban area into riparian corridors and floodplains increasing destabilization<br>• Higher density of wetlands in this area<br>• Substantial potential water quality impacts<br>• Difficult to track extent and severity of degradation in a large area | |
| Scenario C | • Least encroachment into riparian areas<br>• May be opportunities to remove pavement or increase pervious surface areas<br>• Fewer wetland conflicts<br>• Allows for focused restoration efforts in already impacted wetlands<br>• Allows for conservation efforts in undeveloped wetlands<br>• Lowest potential water quality degradation | • If impervious area increases, runoff could cause adverse impacts to flooding and water quality<br>• If BMPs not employed, could impact water quality | |
| **Soils, Prairie and Other Wildlife Habitat** | | | |
| Scenario A | | • Most potential impact on saline soils<br>• High consumption of land and soil<br>• More encroachment into natural areas of county<br>• Potentially more impact on prairies and Threatened and Endangered species | |
| Scenario B | • No known impact on prairies or Threatened and Endangered species, however, large areas of land are impacted | • More encroachment into natural areas of county<br>• Highest consumption of land and soil<br>• Prime farmland may be lost to development | |
| Scenario C | • Least encroachment into natural areas of county<br>• Least impact on prairies or Threatened and Endangered species.<br>• Least consumption of land and soil | | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Community Services** | | | |
| **Education** | | | |
| Scenario A | • Allows continuation of current policies for growth for LPS and rural school districts<br>• Supports growth in multiple smaller communities | • Higher infrastructure costs overall for LPS | |
| Scenario B | • LPS already assumes significant growth in Stevens Creek area | • Higher infrastructure costs overall for LPS<br>• Concentrating growth in one area limits ability of multiple rural districts to grow (least favorable scenario for Waverly School District because of this limitation) | |
| Scenario C | • Significantly lower infrastructure costs overall for LPS<br>• Allows for growth in multiple smaller communities | • Additional infrastructure and service costs for existing LPS facilities<br>• Challenge to develop potential new school concepts not familiar to Lincoln | |
| **Health, Aging and Human Services** | | | |
| Scenario A | | • Difficult to serve proposed new areas with current level of services<br>• Not conducive to creating neighborhoods that meet needs of changing demographics<br>• Appears least effective at meeting aging population's transportation needs<br>• More challenging to provide affordable housing in new growth areas | |
| Scenario B | • Concentrated development in Stevens Creek may better support aging population's transportation needs than Scenario A<br>• Potential opportunity to design road networks that accommodate alternative means of transportation | • Not conducive to creating neighborhoods that meet needs of changing demographics<br>• Appears less effective than Scenario C at meeting aging population's transportation needs<br>• More challenging to provide affordable housing in new growth areas<br>• Growth to east may increase need to move main senior center east | |
| Scenario C | • Supports multi-use developments that promote energy conservation<br>• Most likely to meet aging population's transportation needs<br>• Opportunities for more walkable neighborhoods as means of reduction of chronic disease<br>• Transit may be more feasible in higher density areas and along corridors<br>• Opportunities for close proximity to amenities and health care<br>• Opportunities to retain existing affordable housing stock<br>• Better access to jobs and shopping for low and moderate income families | • Existing affordable housing may need to be protected and maintained both from neglect and from escalating land values<br>• Existing towns/villages may not have capacity relative to city services to support more growth through acreage development<br>• Existing low and medium density residential areas would need careful integration with new higher density infill along corridors and redeveloped commercial nodes | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Fire** | | | |
| Scenario A | • Multi-directional growth would facilitate systemic plan for response on fringes of city | • Increase in service demands and staffing based on population increase<br>• 5 new stations needed; 1 relocated station | |
| Scenario B | | • Increase in service demands and staffing based on population increase<br>• Slower response time due to distance from existing fire stations<br>• 5 new stations needed; 1 relocated station | |
| Scenario C | • Additional facilities and resources concentrated within central part of city limiting costs of new stations | • Increase in service demands and staffing based on population increase<br>• Potential for slower response time if there is an increase in traffic congestion<br>• 3 new stations needed | |
| **Law Enforcement** | | | |
| Scenario A | • LPD response times minimally impacted if staffing and facility issues addressed | • Increase in service demands and staffing based on population increase<br>• 1-2 new LPD team assembly stations needed<br>• | |
| Scenario B | • LPD response times minimally impacted if staffing and facility issues addressed | • Increase in service demands and staffing based on population increase<br>• 1-2 new LPD team assembly stations needed<br>• Possible re-districting of five service areas<br>• Longer travel time for Sherriff to main station<br>• Calls for rural law enforcement may be concentrated in southeast area which could create deficiencies in other areas | |
| Scenario C | • Response times potentially improved if staffing and facility issues addressed<br>• Police officers more centrally located within geographic team areas<br>• Sheriff's office may enter into more contracts with small towns for dedicated patrol coverage<br>• Avoids "saw-tooth effect" for population served in the rural areas | • Increase in service demands and staffing based on population increase<br>• 1-2 new LPD team assembly stations needed<br>• Neighborhoods may need more community maintenance and vigilance<br>• Increased calls for services in small towns | |

| | Pros | Cons | $* |
|---|---|---|---|
| **Parks and Recreation** | | | |
| Scenario A | • Less fiscal impact than Scenario B<br>• Majority of population will have good access to facilities | • Continuation of current park standards may be fiscally unsustainable due to new parkland required to serve edge development<br>• More parks mean more maintenance (16 new neighborhood parks at 64 acres) | $28.1 million + $515,000 annually |
| Scenario B | • Opportunity to fully develop Stevens Creek system of open space, trails, and parks<br>• Majority of population will have good access to parks and recreation facilities | • Continuation of current park standards may be fiscally unsustainable due to new parkland required to serve edge development<br>• More parks mean more maintenance (18 new neighborhood parks at 72 acres) | $33.8 million + $675,000 annually |
| Scenario C | • Majority of population will have good access to parks and recreation facilities<br>• Fewer parks mean less maintenance (7 new neighborhood parks at 28 acres)<br>• May be the most viable scenario to continue current park standards | • Even with less edge development than Scenarios A and B, continuation of current park standards may be fiscally unsustainable | $22.1 million + $450,000 annually |
| **Libraries** | | | |
| Scenario A | • May not need additional libraries | • Expect operating costs to increase proportionately to population increase and cost of living<br>• If needed, may be more difficult to site for underserved population | |
| Scenario B | • Concentrated development in an area makes it easy to identify population to be served and site a new facility | • New library would require additional funds<br>• Total operating cost will increase with additional facility | $10 million + $850,000 annually |
| Scenario C | • May not need additional libraries<br>• May reduce need to adjust to for underserved population along edges of city | • Expect operating costs to increase proportionately to population increase and cost of living | |

# 2. URBAN FORM

## Issues to Consider for Future

An increase in population will increase demand on housing, employment, infrastructure, and services. In terms of future land use, the distribution of these elements has traditionally followed housing. Over the next 30 years, households will be smaller as the population ages with the baby boomers moving into retirement, and with younger generations having smaller families or no children. Housing preferences are expected to change with these shifting demographics, with a greater percentage of the population looking for smaller homes or multi-family housing in more mixed-use, walkable neighborhoods. Deciding where Lincoln and Lancaster County's new dwelling units will be located will have a significant impact on the urban form and its interconnectedness with other major components such as infrastructure, transportation, and public health. A city that focuses the majority of its investments in new infrastructure and services in new edge growth areas has the potential to experience more decline and social stratification in the inner city than one that balances growth at the edge with investment in the existing city. Similarly, if housing options are limited in terms of housing type and location, a city may not be meeting the need for its citizens which are becoming increasingly diverse in age, income, and ethnicity.

## Review of Scenarios

### Scenario A: Multi-Directional Growth

The majority of new residential development occurs in multiple directions at the edge of the community at the current density. At this density, the land consumption required to meet the needs of roughly 96% of all new dwelling units (approximately 26 square miles) will have significant impacts on infrastructure costs and the expansion of services. The continuation of a dispersed auto-oriented population could have detrimental public health implications and makes provision of services less efficient. This scenario is the most similar to the currently adopted 2030 Comprehensive Plan.

### Scenario B: Stevens Creek Growth

The majority of new residential development occurs primarily to the east and south at the edge of the community at the current density. This scenario has the same land consumption requirement as Scenario A, approximately 26 square miles, with similar impacts on infrastructure costs and the expansion of services. This scenario may have higher costs in terms of roads, but lower costs for other infrastructure due to the Stevens Creek trunk sewer which is already under construction and is sized to serve the whole west half of the Stevens Creek basin. Growing substantially further east and south may also continue to decentralize downtown by housing a higher percentage of the population further from the center. Like Scenario A, the continuation of a dispersed auto-oriented population could have detrimental public health implications and makes provision of services less efficient.

### Scenario C: Compact Growth

Two thirds of new residential development occurs where it is most cost effective in terms of infrastructure costs and where the City already has commitments. The remaining 1/3 of dwelling units follow a redevelopment strategy within the existing city, focusing primarily on the downtown core area and commercially-zoned land for mixed-use residential development. Moderately higher density in new growth areas in combination with the redevelopment strategy translate into a significantly lower land consumption (approximately 14 square miles) when compared to Scenarios A and B. The scenario may have positive impacts on service availability and public health due to increased transit and walking opportunities. Scenario C encourages public and private reinvestment in the existing city which may help to alleviate blighted conditions while increasing values and quality of life.

# 3. Rural Form

## Issues to Consider for Future

Six percent of the population in 2040 is projected to be in the unincorporated part of the county, with another 4% in small towns. 4,500 additional residential units will need to be accommodated outside of Lincoln, and the majority of these will be acreages. It is important to consider how best to balance choices for acreage housing with preservation of areas in the county for agricultural production. In addition, acreage development should be planned in such a way as to preserve areas for the future growth of the City of Lincoln and other incorporated cities and towns. Other considerations include the availability and quality of water, waste treatment, the impact on the rural road system and preservation of natural resources.

## Review of Scenarios

### Scenario A: Multi-Directional Growth

This scenario shows rural acreage development occurring in multiple directions, but located based upon a land suitability analysis that takes into consideration proximity to paved roads and highways, rural water availability, developed parcels, livestock operations, and natural resources. It appears to make the most efficient use of paved roads and has the most interconnectivity with the rural communities. This is also one of two scenarios that allow a greater amount of choice for acreage development within the unincorporated area of the county. However, it may result in acreages in the vicinity of high pressure underground pipelines. Waverly School notes Scenarios A and C best support the rural communities. This scenario has a more dispersed impact on farming areas.

### Scenario B: Stevens Creek Growth

This scenario shows rural acreage development occurring in the east and southeast portions of the county, based upon the same type of land suitability analysis. It may provide for more suitable acreage development relative to water supply and sewer, due especially to the fact

that rural water service is available and the water quality is anticipated to be better. However, it concentrates acreage development into the eastern area of the county such that very few projected acreage locations are adjacent to paved county roads. Both this alternative and Scenario A provide for greater choice for acreage development within the unincorporated area of the county. The fact that both urban and acreage growth are directed into the predominantly the eastern portion of the county could have an adverse impact on farming operations in this area. Conversely, it preserves large areas elsewhere in the county for agricultural use.

### Scenario C: Compact Growth

This scenario provides the most compact form of acreage development by directing it to the other cities and towns in the county that already have land zoned or planned for acreages, to the extent that twice the land area needed is available. This provides the least directional and location choice for acreages. However, it would be significantly less costly to the county in the provision of roads and services and would have the least impact on the farming community.

# 4. TRANSPORTATION

## Issues to Consider for Future

Growth of the community and future demands for housing and employment will make it more critical than ever that thoughtful consideration be given to the relationship between land use, urban form and transportation. The changing demographics of the community, including an aging population, are expected to necessitate greater emphasis on shorter vehicle trips and alternate modes of transportation like transit, walking and biking. In addition, the community will be facing increased demand on the transportation system at a time when we are already challenged financially to maintain the existing system and meet new infrastructure needs; sound prioritization will be essential.

Improving the efficiency of the existing street system through the use of Intelligent Transportation System (ITS) technology, signal timing, and effective intersection improvements will be important to maximize the ability of the system to meet future demands. Strategies for maintaining and expanding the levels and areas of service for transit vary significantly with alternative growth scenarios and densities of development. Consideration will need to be given to the continued expansion of the multi-use trail network and development of the on-street bicycle system, while upgrading the existing system including improvements to ensure ADA requirements are met in the pedestrian system. The mix, density and configuration of land use are interconnected with all of these transportation elements.

Energy consumption and environmental impacts will be more critical than ever, and limiting the growth in Vehicle Miles Traveled (VMT) through increased use of alternative modes of travel "Complete Streets," and travel demand management programs such as ridesharing and alternative work schedules will be important to consider. The Lincoln-Lancaster County Health Department will continue to monitor air quality and coordinate efforts to remain in compliance with air quality standards.

# Review of Scenarios

## Scenario A: Multi-Directional Growth

Scenario A largely reflects the current 2030 Comprehensive Plan and current policies related to transportation, with additional transportation infrastructure needed in multiple directions. For the County road system, this represents a more beneficial scenario because many county roads have already been improved based upon the current plan and would be utilized by the acreage development projected with this scenario. For other transportation providers, however, multidirectional growth presents a challenge. The trail system will require more new trail improvements ($9.2 million) in many different areas of the city. Likewise, urban arterial street and sidewalk improvements will be needed in multiple areas around the city, at a cost of $445 million for streets and $14.25 million for sidewalks. For transit, it becomes increasingly difficult to extend routes in all directions (time and distance factors) without investing more into additional transit services. However, the fact that the downtown will continue to be the relative center of the community allows the current downtown transit hub to remain viable for a large amount of the transit service that will be provided.

Under scenario A, a more spread out community with a greater proportion of single family homes and fewer mixed use neighborhoods will likely increase the length of the average vehicular trip, and is expected to increase the overall vehicle miles traveled in the community. This is projected to have a detrimental impact on energy use, greenhouse gas emissions, and air quality levels.

## Scenario B: Stevens Creek Growth

This scenario will result in transportation impacts focused largely in the Stevens Creek area to the east. The County road system is negatively impacted by this scenario because many county roads in the Stevens Creek area have not been improved and there are no current plans to pave them. The focus of acreage development in this area is expected to create a financial strain on the County roads program.

The trail system under this scenario will require new trail improvements similar in cost to Scenario A ($9.2 million), but the improvements will be more concentrated in the Stevens Creek area. Urban arterial street and sidewalk improvements will be slightly more costly than Scenario A and also will be more concentrated in the Stevens Creek area where many roads are not yet built at urban standards ($452 million for streets and $14.32 million for sidewalks). Development in Stevens Creeks presents an added challenge to be able to provide transit service to an area that is growing further away from the current downtown hub. This scenario would require development of a second transit hub in the general area of 56$^{th}$ and O Street. This will be more costly, and with development in Stevens Creek assumed to be at current densities, the effectiveness and efficiency of added transit service is suspect.

As with Scenario A, a more spread out community with a greater proportion of single family homes and fewer mixed use neighborhoods will likely increase the length of the average vehicular trip, and is expected to increase the overall vehicle miles traveled in the community. This is projected to have a detrimental impact on energy use, greenhouse gas emissions, and air quality levels.

### Scenario C: Compact Growth

With regard to transportation, Scenario C is generally the most cost effective future option. With more future growth occurring in the existing city, transportation impacts are expected to be lower than Scenarios A and B. For county road improvements, the more limited urbanizing edge of Lincoln together with acreage development being focused within small cities and towns in the county limit demand on the rural road system compared to the other scenarios.

The trail system under this scenario requires the least amount of improvement ($4.4 million) due to less urbanizing land area in general. Similarly, fewer urban arterial street and sidewalk improvements will be needed, resulting in lower costs ($278 million for streets and $8.98 million for sidewalks). This does not, however, mean that there are no additional costs on the existing street system where additional residential redevelopment is expected to occur under this scenario. The success of locating housing close to employment and commercial centers, the effectiveness of efforts to get people to walk, bike, use transit, share a ride, or change their daily travel patterns, and the development of successful mixed use areas, especially in downtown, will largely dictate the need for interior street improvements.

For transit, the Compact Scenario provides the most potential for providing effective and efficient service. Focusing more future development inside the existing city and limiting edge development to a degree (about 2/3 of future growth still will be on the edges of the community under this scenario) allows transit to take advantage of more transit-ready areas of the city that are on current routes that may be more dense compared to today. This scenario will therefore be the most cost effective for transit services, and it provides the best opportunity to add transit service that attracts more riders. However, this potential for added transit service, along with the desire to attract more transit riders to limit impacts on the existing street system, could mean additional costs for transit service provision overall.

In contrast to Scenarios A and B, a more dense community that provides more housing and commercial choices through redevelopment activity within the existing city will likely decrease the length of the average vehicular trip limit growth in the overall vehicle miles traveled in the community. A denser urban pattern also provides opportunity for increased use of alternate modes of travel including walking, biking, transit, sharing a ride, or changing daily travel patterns. This will have a positive impact on energy use, greenhouse gas emissions, and air quality levels.

# 5. UTILITIES INFRASTRUCTURE

## Issues to Consider for Future

### Water

Utilities are generally sized according to the full build-out service requirement of the area, in order to reduce the need to return in the future with “up-grade” type projects. This means that although the short term demand might require a smaller pipe, a larger and more expensive one will be built to serve the long term growth. For the purposes of this evaluation, urban water

and wastewater issues are examined relative to both the Tier I (to the year 2040) and Tier II (2060) growth areas. The analysis for other utilities is primarily for the 2040 time period.

The City of Lincoln has water rights to withdraw 211 million gallons per day (MGD) from the Platte River and transport that water to Lincoln for the use of customers. Maximum daily usage is anticipated to be about 150 MGD in 2040, but to exceed the current capacity in 2060 at about 225 MGD. Thus, at some point during the 30 year planning period new sources of water will need to be identified to serve the population beyond 2040. The total cost for supply, treatment and transmission from this new plant would be between $750 and $900 million dollars in 2009 dollars. Another consideration for water is that as rural water customers are annexed, service connections are made to the Lincoln water system. There have been recent discussions with rural water districts regarding the cost of annexation of rural water customers. While the reimbursement cost to rural water has not yet been agreed upon, the cost may be significant.

## Wastewater

With regard to wastewater, Lincoln has a long history of using gravity flow sewer to serve wastewater customers. In order for this to continue, Lincoln has traditionally grown along drainage basins, beginning at the lower end of the basin and growing toward the upper end. The two treatment plants in place have enough capacity to handle wastewater needs through 2060. Depending on the direction and type of growth, there may be a need for a holding facility in the southwest which would retain wastewater until an off-peak time when it could be pumped to the treatment system. Increased clean water regulations limiting nitrogen and phosphorous discharges may increase the need for improvements. There will likely be increased interest in wastewater re-use projects due to limited water supplies and the need for conservation and sustainability of the operation.

Wastewater treatment in the county is handled in most cases by individual wastewater treatment systems (sewage lagoons and septic systems), and in some cases by small treatment plants that serve a few homes in an association. The Lincoln Lancaster County Health Department recommends individual wastewater systems be built as lagoons rather than septic systems due to the increased potential for groundwater contamination from septic systems.

## Watershed

There is a need to continue with watershed master planning activities with the eventual goal of a unified master plan for the city and surrounding growth areas. Having watershed plans in place ahead of development is important to minimize flood risk and stream erosion, and to help protect water quality and other water resources. Current stormwater ordinances require all new private development to retain stormwater on site. Most new public facilities are those associated with master plans or drainage from public right of way (mainly streets). As a drainage basin develops, impervious areas such as rooftops and parking lots can affect the ability of the basin to drain stormwater and the amount of stormwater that runs off. Stormwater, erosion and sedimentation, and floodplain regulations should continue to be enforced and refined.

## Electricity and Natural Gas

Increasing population means increased electrical service requirements regardless of the direction of growth. All scenarios would require improvements to transmission and substation facilities. Norris Public Power District will have no difficulty serving the addition 4,500 dwelling units projected for the remainder of the county; however, as the City grows and annexes areas, Norris loses customers to LES. There are major natural gas pipelines in areas that have been identified for new growth in all three scenarios. Lincoln Lancaster County Health Department reviews proposals for new development for any impacts or possible hazards from natural gas pipelines.

# Review of Scenarios

## Scenario A: Multi-Directional Growth

Scenario A presents a basic challenge to utility providers: When growth occurs in all directions, projects must be planned and built on all sides. This means that resources must be spread out over a larger area. In a multi-directional scenario, only a percentage of the total potential density will be built in the near, and in some cases distant, future. This means that existing capacity may go unused, sometimes for decades.

Scenario A poses some challenges for specific utilities. The addition of growth areas to the southwest would require additional trunk sewer and water main projects. It is likely that a wastewater storage facility would be needed in the southwest within the 50 year planning timeframe (Tier II). Additional water service would require pressure district improvements and the addition of a northwest loop main. Rural water would be impacted to the greatest degree in this scenario. LES would require substation and transmission improvements on multiple fronts which pose higher costs. Watershed Management cautions that care must be taken to use best management practice to protect stream stability in new growth areas. The majority of new stormwater handling facilities would likely be smaller private detention facilities associated with new subdivisions. Black Hills Energy notes that limited infrastructure is available.

In 2009 dollars, this scenario has an estimated cost for capital improvements of $844 million for 2040, an additional $578 million to 2060, and an annual maintenance cost of $5.95 million, as reported by City of Lincoln Water, Wastewater and Watershed Management divisions. LES reports costs for Scenario A would be higher than for B, but not as high as C.

## Scenario B: Stevens Creek Growth

This scenario maximizes the total potential density in a single growth area rather than spreading it over several areas. In this way the assets in one area can be more fully utilized before moving on to a second or third growth area.

There are significant assets already in place or under construction, including the Stevens Creek trunk line sewer and major LES transmission facilities. In the time period leading up to 2040, treatment improvement costs would be low due to the majority of growth being in an area that drains to the Northeast Wastewater Treatment facility where there is a good deal of capacity. After 2040, growth would cause more impacts to the Theresa Street facility. Water service enters the city from the northeast and there is excess capacity in that pressure level. A watershed master plan is in place for Stevens Creek. Watershed Management cautions that

care must be taken to use best management practice to protect stream stability in new growth areas. The majority of new stormwater handling facilities would likely be smaller private detention facilities associated with new subdivisions.

Norris Public Power identifies this Scenario as having the greatest effect on their service area with major loss of service connections to LES. Black Hills Energy notes plenty of pressure, but there may be environmental challenges.

Acreage development is concentrated in an area that generally has better groundwater and is served by Cass and Lancaster County rural water districts. The future acreage areas identified are also outside of the Salt Creek drainage basin, with little if any future chance of them being annexed into Lincoln.

In 2009 dollars, this scenario has an estimated cost for capital improvements of $537M for 2040 and an additional $642M to 2060, and an annual maintenance cost of $5.95M, as reported by the Lincoln Water, Wastewater and Watershed Management divisions.

## Scenario C: Compact Growth

This scenario is generally the most fiscally conservative of the three. For some utilities the capacity to serve the Tier I area is already built. In others, only minor extensions would be required. The increase in density, and thus the service demand on existing infrastructure, may mean that some upsizing of water and wastewater pipes may be needed. Although the increased cost of the pipes is relatively small, it would be desirable to identify these areas of future higher density so that specific improvement needs can be determined. Replacement may improve overall system performance by reducing the amount of infiltration into sewer pipes and the amount of loss from water pipes. Transmission and collection pipes in major arterials are built to current standards, so redevelopment along corridors and at nodes may not require improvement.

LES notes this scenario poses challenges. Because there is very little excess capacity in the system, an increase in service connections in the existing city would increase the load on the older lines which may have to be replaced and new capacity added. Because of existing structures this could cause significant disturbance to residents and be quite expensive for LES. However, redevelopment along corridors and at commercial nodes may not increase loads significantly and current capacity might be sufficient in some cases. Norris Public Power District identifies this scenario as being most desirable because fewer rural connections would be lost to LES, at the same time, maintenance costs would increase for the same reason. Black Hills notes the need for the least amount of new infrastructure in this scenario.

In 2009 dollars, this scenario has an estimated cost for capital improvements of $538 million for 2040, an additional $257 million to 2060, and an annual maintenance cost of $3.725 million, as reported by the Lincoln Water, Wastewater and Watershed Management divisions.

# 6. Natural Resources and Environment

## Issues to Consider for Future

Several agencies have noted that growth would be expected to impact water quality, depending on the protections in place. Methods of wastewater treatment and management practices to reduce water quality impacts from acreages will be important. Soils are generally higher quality in the northern part of the county, but the highest quality farmland in Lancaster County can be found in the floodplains. It will be important to consider soil characteristics and methods to minimize erosion as urban and rural development occur. Growth close to prairies can have an adverse impact on native fauna, and near-term development can impact some management of prairies such as burning.

There are important water resources to consider when examining urban and rural growth. Wetlands can be impacted by water flow and water quality changes due to stormwater runoff and stream incision. Several threatened and endangered species are located in the Eastern Saline wetlands, mostly along Salt, Little Salt and Rock Creeks north of Lincoln. These include the federally endangered Salt Creek Tiger Beetle. Buffer protection zones can be a way to preserve endangered species and their habitat. In these areas, impacts on ground water may affect the up-flow of salt into the wetlands. There is a need to continue with watershed master planning activities with the eventual goal of a unified watershed master plan for the city and surrounding growth areas. Challenges associated with an increase in population may include increased potable water demand, increased impermeable surfaces, increased pollutant loads, altered hydrology, increased wastewater discharge, increased habitat fragmentation, and loss of green space. Water quality, wetlands, and watershed/floodplain issues are difficult to separate because they function as a larger system.

## Review of Scenarios

### Scenario A: Multi-Directional Growth

Urban expansion has a profound negative impact on water quality. Multiple drainage basins mean multiple opportunities for water quality degradation while also making it difficult to focus mitigation, restoration or conservation efforts effectively. However, with growth in new areas there are also opportunities for more sustainable design. In general there is a higher concentration of wetland areas in new growth areas compared to existing urban areas. This scenario includes more potential growth to the north where the majority of wetland, saline wetland and endangered species are located. Rural expansion increases the number of individual wastewater systems which increases the opportunity for groundwater contamination. Rural development in the area near Denton may encourage acreage clusters and other development that could impact the future preservation potential of native prairies in the area. Development near wildlife management areas and state recreation areas will impact hunting on those lands.

### Scenario B: Stevens Creek Growth

Concentrating the majority of future urban and rural growth within a single drainage basin allows focus of mitigation, restoration and conservation efforts. As in Scenario A, with growth in new areas there can also be opportunities for new development to be more sustainably designed. In contrast, there is not as much growth shown to the north where major impacts to endangered habitat are possible. Rural expansion increases the number of individual wastewater systems, which increases the potential for groundwater contamination. Rural areas shown are outside of the areas identified as having the best soil and farmland, but still within the areas with good groundwater and rural water supply. Development near wildlife management areas and state recreation areas will impact hunting on those lands.

### Scenario C: Compact Growth

This scenario is expected to have the lowest impact to natural resources by providing denser development with a higher percentage of multi-family dwellings and good access to alternative transportation. Redevelopment of existing areas provides opportunities to remove pavement or increase pervious surface areas, but if redevelopment increases impermeable areas some existing drainage systems could be overstressed. Increasing density in built out areas will have less environmental impact, but will also offer fewer opportunities for mitigation where there is impact. This scenario would cause the least impact to undeveloped watersheds and allow for focused restoration efforts in already impacted urban waterways. Having more limited rural expansions reduces the risk of ground and surface water contamination and may increase the opportunity for rural development to connect to wastewater and water systems in other towns.

# 7. COMMUNITY SERVICES

## Issues to Consider

Regardless of the type and direction of growth, an increase in population will increase the demand for each of the community service areas outlined in this section. Likewise, changing demographics and the projected increase in number of people age 65 and above will have a significant impact. Increases in personnel, facilities and funding will be needed if the same level of service is to be provided to a larger population in the future.

### Health, Aging and Human Services

Increased population and development will increase the demand for all types of health services, including community health services, outreach, and environmental public health. Ensuring that the built environment encourages active living and that services are easily accessible within neighborhoods will both be important health considerations. The first half of the planning period will see a great increase in young elderly who may be retired or still working and probably considering a change in lifestyle. Health issues and increased demand for ambulatory care will be followed by increased need for home services and nursing home care. In the latter half of the planning period, mobility issues and the need for long-term care will grow dramatically.

It will be important to consider how future growth can support a wide distribution of affordable housing to be near jobs and shopping, especially for low and moderate income families. This includes preserving existing affordable housing, promoting the creation of new affordable housing across the community. Consideration should be given to convenient access to neighborhood services and to maximizing mobility choices.

### Fire and Rescue Services and Law Enforcement

As the community grows, there is the potential for increased traffic and travel distances to impact response time. A significantly larger population will require an increase in Fire and Rescue staffing and the number and location of fire stations. Likewise there will be a need for increased Police staffing, and consideration would need to be given to the location of team assembly stations and the potential redistricting of service areas and community police teams. The increased rural population would also result in more service calls for the Sheriff.

### Parks and Recreation

Parks will continue to pursue opportunities to make trail and green space connections and integrate school/park site development. The increased population will require more parkland.

### Libraries and Education

Demand for library space will be determined by type of growth to some extent. Developments in technology will have a great effect upon the need for increased space. All school districts will likely experience growth, but the direction and intensity will determine the degree of impact. Determining the site of future schools and transporting students to schools are major concerns as well as the operation and maintenance of school services.

## Review of Scenarios

### A. Multi-Directional Growth

Scenario A spreads growth evenly around the existing City which may make service adjustments easier for several departments. Libraries may be able to maintain service without adding new facilities. Response times for fire may necessitate new stations, which are already needed in parts of the city. Additional assembly stations for police may be needed. The edge of the city presents a challenge for both fire and law enforcement in determining jurisdictions.

This scenario has the potential to have a greater impact on the level of services the Lincoln-Lancaster County Health Department (LLCHD) provides to the community. Less compact growth does not encourage use of alternate modes of travel, like biking and walking, which promote healthier lifestyles. Existing high-pressure gas pipelines in the southeast area may create some potential conflicts with acreage development.

Scenario A would require additional parkland in order to maintain current standards: 16 new neighborhood parks totaling 64 acres. Park service under this scenario would be expected to cost less than Scenario B, but more than Scenario C. Capital costs for parks are estimated to be $28.1 million, with $515,000 annually for operation and maintenance.

This scenario would likely have significantly higher costs than Scenario C for the provision of Lincoln Public Schools (LPS) services, however because it is similar in pattern and direction of growth to the 2030 Plan, this alternative generally supports existing and planned school infrastructure for LPS. Waverly School District 145 (serving the communities of Alvo, Eagle, Prairie Home, Walton, and Waverly) prefers this scenario to Scenario B due to the ability of smaller communities throughout the county to expand.

## B. Stevens Creek Growth

Some of the same concerns in Scenario A apply to this scenario. Libraries note this scenario would likely necessitate a new library in the Stevens Creek area at a cost of about $10 million and with annual operating costs at $850,000. Fire and law enforcement note increased response times and the need for new facilities.

As with Scenario A, this scenario also has the potential for greater impact on the level of services LLCHD provides to the community. Similar concerns regarding pattern of urban development and healthy lifestyles, as well as the potential conflict for acreages existing high-pressure gas pipelines in the county were expressed for this scenario.

Additional parkland would be needed in this scenario: 18 new neighborhood parks totaling 72 acres. This is the most costly scenario for park services, with $33.8 million in capital costs and $675,000 annually for operation and maintenance.

Future LPS sites would be concentrated in the Stevens Creek area. Like Scenario A, this alternative would likely have significantly higher costs than Scenario C for the provision of LPS services. Waverly School District 145 views Scenario B as the least favorable scenario because of the focus on unidirectional development, limiting the expansion of the City of Lincoln and rural communities to one particular area. Palmyra District OR-1 feels that the Stevens Creek Scenario will have the greatest impact on its services related to expansion of population within the southern portions of the Stevens Creek basin out to the year 2060.

## C. Compact Growth

Concentration of population in the existing city will increase the need for police and fire and rescue personnel to be more centrally located. Existing facilities may be used, though potentially requiring more resources at those locations. Response times are difficult to predict with shorter distance on the one hand and more congestion on the other. The shift of development to small towns will increase service calls from these areas necessitating dedicated deployment of the sheriff's office.

Existing libraries should be able to serve this scenario. Scenario C has the potential for the least impact on the level of services LLCHD provides to the community. This scenario promotes compact development, and the urban pattern associated with this scenario encourages use of alternate modes of travel, like biking and walking, which promote healthier lifestyles.

Significantly less additional parkland would be needed under this scenario: seven new neighborhood parks totaling 28 acres. This is the least costly scenario for Parks & Recreation, with $22.1 million in capital costs and $450,000 annually for operation and maintenance. This scenario supports good access to parks and recreation facilities. While there may be fewer

parks with this alternative, there is potential for lower maintenance demand and higher utilization.

Scenario C provides an opportunity to limit LPS's future costs significantly by reducing transportation costs in numerous categories. Existing infrastructure and services will see increased utilization and will need additional attention in a shorter time frame, but overall infrastructure costs would be significantly lower than in Scenarios A or B. Waverly School District 145 views Scenario C as most preferable due to direction of rural development to areas around smaller towns.

# Appendix

## Department Responses



Lincoln/Lancaster County Planning Dept.
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# Appendix

# Black Hills Energy Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

BHE would anticipate an increase in infrastructure and employee requirements but feels confident to have a robust supply of natural gas available for this type of growth.

B. In general, what are the pros and cons of each alternative?

Increased costs to operations and maintenance.
Increase revenue and employment would be pro results.

C. What are the implications of each scenario on service provision?

BHE would be able to serve all scenarios, so this is a non issue.

D. What is the impact of each scenario on maintenance and operation costs?

Subsequent cost increases due to building new infrastructure then maintaining the infrastructure for future years.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Not getting a return of our investment if there are delays with filling developments or lower gas than anticipated gas usage with this being an issue with any of the 3 scenarios.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Costs of infrastructure greater with scenarios A & B with potentially less consumers due to distance between customers.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| 5.e. Utilities: Natural Gas | | |
| **5.e.i. What are the impacts on natural gas services for each of the scenarios?** | | |
| Scenario A | **Limited infrastructure, so potentially higher initial costs to serve.** | |
| Scenario B | **East side of Lincoln supplied natural gas by 3 separate mains, so high pressure gas is most available with this scenario.** | |
| Scenario C | **Least amount of new infrastructure with this scenario due to solid core supply of gas.** | |
| **5.e.ii. Are there any additional consideration presented by each of the scenarios?** | | |
| Scenario A | **BHE is in their 5th year of a 10 year plan to fortify gas pressures in West Lincoln. BHE continually improves gas system to ensure availability with any growth scenario.** | |
| Scenario B | **Possible environmental or other requirements to hinder develop through the Stevens Creek watershed.** | |
| Scenario C | **No concerns with this scenario.** | |

B City of Hickman Sept 2018
Villages Questionnaire Responses

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Between 2006 and 2008, the City of Hickman has experienced a 67% growth increase in population. Hickman contributes this growth to its adjoining proximity to Lincoln, a School District which is renowned for its quality education system, local businesses and Hickman's overall commitment to growth and improvements while keeping its small town atmosphere and quality of life commitments.

Hickman's 2007 – 2030 Comprehensive Plan addresses growth within Hickman's one mile limit by allowing Transitional Agriculture (TA) to become Low Density Residential or Residential Estates (R1), requiring ghost platting. General Commercial District (GC) is designated along South 68th Street, north of Hickman to Martell Road, and Commercial/Industrial (C/I) along Hickman Road (Spr. 55) to the west.

The City of Hickman takes a pro-active approach to growth by improving its infrastructure to meet growth demands, planning for the future and working with a variety of stakeholders in the area.

B. In general, what are the pros and cons of each alternative?
   a. Growth will impact South 68 Street, South 82 Street, Roca Road and Martell Road. Primary concerns for Hickman would be safety of the intersections and widening of South 68 Street for traffic flow between Roca Road and Hickman Road.
   b. Growth will impact South 68 Street, South 82 Street, Roca Road and Martell Road to the north, South 68 Street and Stagecoach Road to the south of Hickman, Hickman Road to the east and west. Primary concerns for Hickman would be safety of the intersections, roadway improvements for traffic flow and water distribution.
   c. Growth will impact South 68 Street, South 82 Street, Roca Road and Martell Road to the north, South 68 Street and Stagecoach Road to the south of Hickman, Hickman Road to the east and west. Primary concerns for Hickman would be safety of the intersections, roadway improvements for traffic flow and water distribution.

C. What are the implications of each scenario on service provision?
   a. Services would be county and not City of Hickman.
   b. Services would be needed within the City of Hickman one mile limit.
   c. Services would be needed within the City of Hickman one mile limit.

D. What is the impact of each scenario on maintenance and operation costs?
   a. Maintenance and operation costs impact would be minor.
   b. Maintenance and operation costs impact would be minor.
   c. Maintenance and operation costs impact would be minor.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?
    a. Growth is consistent with Hickman's Comprehensive plan with the exception of North 68 Street Gateway Overlay District.
    b. Growth is consistent with Hickman's Comprehensive plan with the exception of a Commercial/Industrial Mixed use to the west of Hickman along Hickman Road.
    c. Growth is consistent with Hickman's Comprehensive plan with the exception of North 68 Street Gateway Overlay District and a Commercial/Industrial Mixed use to the west of Hickman along Hickman Road.

F. What are the impacts of projected demographic shifts on service provision for each scenario?
    a. Close proximity to needed services will cause minor impacts.
    b. Close proximity to needed services will cause minor impacts.
    c. Close proximity to needed services will cause minor impacts.

# Villages Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

B. In general, what are the pros and cons of each alternative?

C. What are the implications of each scenario on service provision?

D. What is the impact of each scenario on maintenance and operation costs?

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

F. What are the impacts of projected demographic shifts on service provision for each scenario?

# County Engineer Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Total increase is 44% from 2010. Impact to County Engineering is increased traffic volumes requiring road improvements and additional road maintenance.

B. In general, what are the pros and cons of each alternative?

Scenario A – Growth is better suited to existing improved roads. Some acreage areas are not on existing paved roads.

Scenario B – Growth is concentrated in one area and one road improvement will help more area. Very few acreage areas are on existing paved roads

Scenario C – Very little impact to County roads. Limited choice for acreage development. Incorporated villages play an important role in rural growth. Coordination is needed with them for this option.

C. What are the implications of each scenario on service provision?

As the County population grows, more vehicle-miles are accumulated. Maintenance and road improvements are in higher demand.

D. What is the impact of each scenario on maintenance and operation costs?

As the County population grows, more vehicle-miles are accumulated. Maintenance and operation costs are increased.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

As growth occurs, road improvements are needed. Extra RUTS roads are more costly in all aspects.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

An older population and smaller households may reduce the number of trips per lot but should not be a significant reduction to affect our operations.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| 2. Rural Form | | |
| **2.a. What particular opportunities and challenges are presented by each of these growth scenarios on a countywide scale?** | | |
| Scenario A | **Growth fits well with existing improved roads.** | |
| Scenario B | **Proposed acreage locations will require unplanned road improvements. Developers may be required to participate in funding those improvements.** | |
| Scenario C | **With little growth in County, no issues.** | |
| **2.b. What are the possible impacts of the scenarios on the county roads system related to the pattern of acreage development?** | | |
| Scenario A | **Most acreage areas are proposed on existing paved roads, which is little impact.** | |
| Scenario B | **Several acreage areas are proposed on gravel roads. Development must include County road improvements by developer.** | |
| Scenario C | **Very little, if any, impacts.** | |

## 3.a. Streets and Highways

**3.a.i. What are the differences in cost for street improvements by scenario?**

| | | |
|---|---|---|
| Scenario A | **Average cost for road improvements.** | |
| Scenario B | **Higher than average cost for road improvements. Concentrated City growth will annex County roads that have not been improved in any form making City improvements more costly.** | |
| Scenario C | **Lower than average cost for road improvements.** | |

**3.a.ii. What are the impacts to operations and maintenance budgets for each scenario?**

| | | |
|---|---|---|
| Scenario A | With increased County population comes increased traffic on County roads. One thing that is always changing is the total miles of County roads. As Lincoln (and small villages) grows, the total miles of County roads decreases, but new rural subdivisions add miles of improved County roads along with increased traffic. Therefore the total maintenance and operations required stays somewhat the same. | |
| Scenario B | With increased County population comes increased traffic on County roads. One thing that is always changing is the total miles of County roads. As Lincoln (and small villages) grows, the total miles of County roads decreases, but new rural subdivisions add miles of improved County roads along with increased traffic. Therefore the total maintenance and operations required stays somewhat the same. | |
| Scenario C | With increased County population comes increased traffic on County roads. One thing that is always changing is the total miles of County roads. As Lincoln (and small villages) grows, the total miles of County roads decreases, but new rural subdivisions add miles of improved County roads along with increased traffic. Therefore the total maintenance and operations required stays somewhat the same. Scenario C could have higher maintenance costs if the City doesn't grow as much as the other scenarios. The increased traffic volumes as a growing community will still require County road improvements. | |

| | | |
|---|---|---|
| **3.a.v. What opportunities for efficiencies are presented by each scenario?** | | |
| Scenario A | Scenario A is more efficient in the sense of using more existing paved roadways, instead of gravel, in various areas of growth around Lincoln that have previously been planned for future growth. | |
| Scenario B | Scenario B is less efficient due to the need to improve more gravel roads where acreage development is proposed. However, with urban growth concentrated in the Stevens Creek area, a single road improvement in the Stevens Creek area can benefit more growth area instead of spreading multiple road improvements in different areas around the city. | |
| Scenario C | Scenario C provides for an efficiency in that less county road improvements are needed with less urban and rural development occurring in general along County roads. | |
| **3.a.viii. What are the impacts of projected demographic shifts on travel patterns for each scenario?** | | |
| Scenario A | An older population and smaller households may reduce the number of trips per lot but should not be a significant reduction to affect our operations. | |
| Scenario B | An older population and smaller households may reduce the number of trips per lot but should not be a significant reduction to affect our operations. | |
| Scenario C | An older population and smaller households may reduce the number of trips per lot but should not be a significant reduction to affect our operations. | |
| **3.a.ix. What are the impacts to the county road system for each scenario?** | | |
| Scenario A | See Question 2. | |
| Scenario B | See Question 2. | |
| Scenario C | See Question 2. | |

| 3.a.x. What is the impact of each scenario on the south and east beltway projects? | | |
|---|---|---|
| Scenario A | None. | |
| Scenario B | The East Beltway will be in Tier I area causing higher right-of-way costs and more design issues being in an urban area. | |
| Scenario C | None. | |

## 3.c. Pedestrian and Bicycle

| 3.c.iv. What are the impacts to opportunities for walking and biking in each scenario? | | |
|---|---|---|
| Scenario A | Walking is not promoted on County roads. Biking is also not desirable and the paved shoulders are not built for bikes. Biking on the paved shoulders is an unintended benefit for those that choose to ride on County roads. | |
| Scenario B | Walking is not promoted on County roads. Biking is also not desirable and the paved shoulders are not built for bikes. Biking on the paved shoulders is an unintended benefit for those that choose to ride on County roads. | |
| Scenario C | Walking is not promoted on County roads. Biking is also not desirable and the paved shoulders are not built for bikes. Biking on the paved shoulders is an unintended benefit for those that choose to ride on County roads. | |

# County Sheriff Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

One has to understand the duties of the Sheriff's Office to understand the increase workload and subsequent personnel increases necessary for this population growth. When you look at the resulting 12,600 more people in the county for the Sheriff to provide direct law enforcement services to, a proportionate increase in Patrol and Investigations personnel is necessary. However, in 1994, Lancaster County commissioned Carter Goble Associates to develop a space needs study, which included projected workloads and personnel. Their study projected a 'saw-tooth' effect for population served in the rural areas. They projected an increase in rural population within the three mile limit, then the City would annex an area; population would increase, City would annex an area and so on. Subsequently, CGA projected no increase in those divisions providing basic law enforcement services from 1994-2014. These projections were right on target until Lincoln enacted impact fees. My sense is acreage development is increasing outside of the 3 mile limit to avoid impact fees. I believe the traditional 90/10 population split between Lincoln and Lancaster County will continue to shift. The Sheriff's Office currently provides Law Enforcement services for all cities, towns, and villages in Lancaster County except Lincoln. We currently contract with the two largest cities (Waverly and Hickman) for dedicated patrol coverage in their cities. Whether these two cities would form their own police department would certainly have an impact on our personnel projections.

The rest of the Sheriff's duties- civil process, fugitive task force, narcotics task force, court security, prisoner transportation, motor vehicle title inspections, sex offender registrations, handgun purchase permits and records management- would increase proportionately with the increase in the entire county population. I'm sure there are planning tools that can project the percentage of a given population involved in the criminal justice system, be that civil or criminal.

B. In general, what are the pros and cons of each alternative?

The more people we have, the more traffic we will have; the more law violators we'll have; the more civil litigation people will be involved in; law enforcement officers we will need.

C. What are the implications of each scenario on service provision?

D. What is the impact of each scenario on maintenance and operation costs?

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

F. What are the impacts of projected demographic shifts on service provision for each scenario?

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| 6.d. Law Enforcement | | |
| **6.d.i. What are the impacts to response time in each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **6.d.iii. What are the impacts to sheriff's services in each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

# Engineering Services Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Without a major change in travel behavior, the LOS on streets in Lincoln will continue to decline. Streets which many motorists consider to be overcrowded may become unacceptable as wait times at traffic signals becomes considerable longer.

B. In general, what are the pros and cons of each alternative?

Focusing development in one part of town makes it easier to provide utilities, but may overload streets in that area. Spreading development out around town provides more options for people who want to live in a certain area of town, though the cost of providing utilities is higher. Going with more compact (infill) growth may pay off in the long run by encouraging more usage of transit, but in the short term it will likely make infill areas more crowded with traffic until the transit and other services catch up with the growth. More travel within the same footprint the City now has will result in increased levels of pollution, possibly increasing to the point that the City could be out of compliance with Federal standards.

C. What are the implications of each scenario on service provision?

Without having model runs or even a more defined concept of the proposed internal growth, it is very difficult to assess the impacts of each of the scenarios. The "growing outward" alternatives will require the construction of new streets around the periphery of the City, with some additional need for capacity on internal streets. It is difficult to judge what the impacts of the infill growth option will be without running the transportation model. At first glance, it would seem that significant amounts of additional traffic within the same footprint the City currently has will require significant additional widening of streets, most likely invalidating the 2+1 system as an option to handle traffic. With the City's past reluctance to widen streets, it is important to know the impacts of each scenario, beyond just the speculation of staff. In the event that travel patterns do change, additional bus service will need to be provided, increasing the need for bus turnouts and shelters to be placed within the right-of-way to ensure that service levels do not increase below acceptable standards.

D. What is the impact of each scenario on maintenance and operation costs?

More streets mean more O&M costs. New streets would need less maintenance in the short term, but over time would raise the bill. The compact growth scenario would reduce the amount of new streets built, but may result in street widenings, possibly to the point of getting similar numbers of lane miles to maintain. Streets that are more crowded could lead to higher maintenance costs when traffic control is added into the equation.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Considerable growth in the Stevens Creek area may put more pressure on the City to build the East Beltway. Allowing a lot of growth in that area prior to the construction of the East Beltway may also create greater opposition to the road by people living nearby. Without having model runs available, the impacts of these scenarios on the ability to move traffic is unknown. This becomes our biggest concern when looking at how congestion and air quality will be impacted by each of these scenarios.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

An aging population, presumably with more retirees, could create a shift of more trips away from the peak hours to off-peak hours. This would increase the daily volumes the streets could handle. Youth and the elderly are represented in a disproportional amount of crashes, so it is possible those numbers would go up as well, with attendant increases in non-recurring delay. More homes with fewer trips per household will not necessarily decrease the number of daily vehicle trips occurring, but it will spread them out and may need to be taken into account by the modeling software.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **1. Urban Form** | | |
| **1.a. What particular opportunities and challenges are presented by each of these growth scenarios on a neighborhood and citywide scale?** | | |
| Scenario A | **Offers the most choice as to where people would be able to live. Requires the construction of a considerable number of new streets to accommodate the growth.** | |
| Scenario B | **With the strong connection between Lincoln and Omaha, many people want to live on the northeast side of town to facilitate travel between the two cities. Excluding internal streets, this is the most expensive option based on the number of new streets that will need to be built.** | |
| Scenario C | **Assuming people will change their ways and habits, this has the possibility for making Lincoln a more compact, alternate mode-friendly town. In the short term, until the City really densifies, it is quite likely that the transportation/congestion situation will get worse before it ever can get better.** | |

| | | |
|---|---|---|
| **1.b. What particular sustainability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario **A** | **If standards are changed and bike lanes are added to streets, a fairly robust network of bicycle friendly streets can be made around town. Growth in all directions could help spread traffic out, meaning the traffic in interior portions of town will not grow significantly, thereby not requiring substantial street widening.** | |
| Scenario **B** | **If properly planned and developed, this area could contain many of the services needed to support the new population increase in the area. Adding bike lanes to the street standards would create a robust network on the east side of town. Adding most of the population in one direction could also cause existing streets to be overloaded if people still all need to get to the same existing places for work, shopping & entertainment.** | |
| Scenario **C** | **If people can be convinced to abandon their cars, this could lead to a more transit-friendly environment. With convenient services nearby, people could make more trips on foot, lowering VMT. Without corresponding transit system expansion & improvement, conditions could get significantly worse as congested areas will become more congested with additional traffic.** | |
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario **A** | **Choice of where to live is much greater.** | |
| Scenario **B** | **People living in Lincoln but wanting quick and easy access to Omaha are served.** | |
| Scenario **C** | **People who want to live in more crowded, densely packed conditions, possibly with greater walkability, are served.** | |

| 3.a. Transportation: Streets and Highways | | |
|---|---|---|
| **3.a.i. What are the differences in cost for street improvements by scenario?** | | |
| Scenario A | Should be fairly similar to existing Comprehensive Plan with minor changes to account for differing boundaries. | |
| Scenario B | Slightly higher than A, but a similar response. | |
| Scenario C | Largely unknown. Fewer streets should need to be built around the periphery, but much more costly widening of streets in the existing built up areas and neighborhoods may be required. | |
| **3.a.ii. What are the impacts to operations and maintenance budgets for each scenario?** | | |
| Scenario A | More streets to maintain. The new streets should be relatively inexpensive as far as maintenance for a number of years, and then their cost will escalate. | |
| Scenario B | More streets to maintain. The new streets should be relatively inexpensive as far as maintenance for a number of years, and then their cost will escalate. | |
| Scenario C | Less new streets to maintain, but existing streets may need widening, resulting in more lane miles. O&M costs may rise as streets become more crowded and traffic control takes a larger share of the costs on each project. Higher volumes on existing streets mean worse conditions when streets are closed for work, worsening conditions on detour routes. | |
| **3.a.iii. Please quantify impacts on VMTs for each scenario to the best of your ability.** | | |
| Scenario A | 37-53% increase | |
| Scenario B | 35-55% increase | |
| Scenario C | 26-47% increase | |

| | | |
|---|---|---|
| **3.a.iv What is the general impact on trip length and amount of trips for each scenario?** | | |
| Scenario A | Higher trip lengths as we grow farther out and add people. When trip lengths increase, people are more likely to link trips and share rides, potentially resulting in lower numbers of trips. | |
| Scenario B | Higher trip lengths and number as we grow farther out and add people. Could be somewhat offset if the Stevens Creek area grows into its own "community" with all the needed services. | |
| Scenario C | Very little initially, though with transit and walkability improvements, it could reduce VMT over time. Trip lengths may be shorter if goods and services are clustered nearby the new infill growth. | |
| **3.a.v. What opportunities for efficiencies are presented by each scenario?** | | |
| Scenario A | As new roads are built, there are many opportunities for creating efficiencies. Efficiencies may result from materials, methods or changing travel patterns and habits. | |
| Scenario B | As new roads are built, there are many opportunities for creating efficiencies. Efficiencies may result from materials, methods or changing travel patterns and habits. | |
| Scenario C | With fewer streets being built, there are less opportunities for creating efficiencies. Most efficiencies in the roadway network will need to be retrofits, which are typically more expensive. There may be opportunities for efficiencies as related to people's travel patterns and habits. | |
| **3.a.vi. What particular opportunities and challenges for travel demand management are presented by each scenario?** | | |
| Scenario A | Travel demand management (TDM) for the most part is not scenario specific. TDM requires effort being made by residents and businesses to encourage others to do things to reduce trips, particularly during the peak travel hours of the day. | |
| Scenario B | TDM for the most part is not scenario specific. TDM requires effort being made by residents and businesses to encourage others to do things to reduce trips, particularly during the peak travel hours of the day. With the concentration of growth on the east side of town, people who commute daily to Omaha might be more likely to live in this area, which may present greater opportunities for car and van-pooling. | |
| Scenario C | TDM for the most part is not scenario specific. TDM requires effort being made by residents and businesses to encourage others to do things to reduce trips, particularly during the peak travel hours of the day. A more compact growth scenario might encourage people to take more advantage of alternate modes. | |

| | | |
|---|---|---|
| **3.a.vii. What particular opportunities and challenges for intelligent transportation systems are presented by each scenario?** | | |
| Scenario A | **Intelligent Transportation Systems (ITS) are considered with every project we construct, as well as at other areas of opportunity where they can create a positive impact on the transportation network.** | |
| Scenario B | **ITS are considered with every project we construct, as well as at other areas of opportunity where they can create a positive impact on the transportation network.** | |
| Scenario C | **ITS are considered with every project we construct, as well as at other areas of opportunity where they can create a positive impact on the transportation network. With fewer new streets being built under this option, many projects will need to be retrofits, which typically cost more than when ITS elements are placed on a new project.** | |
| **3.a.viii. What are the impacts of projected demographic shifts on travel patterns for each scenario?** | | |
| Scenario A | **People theoretically driving less.** | |
| Scenario B | **People theoretically driving less. With the presence of many medical facilities on the east side of town, an aging population may be better served.** | |
| Scenario C | **People theoretically driving less. An aging population may not be as likely/able to take advantage of the walkability & transit opportunities, resulting in the need for more subscription transit service if the hopes of this scenario are to be met.** | |
| **3.a.ix. What are the impacts to the county road system for each scenario?** | | |
| Scenario A | **Lots of them would be paved as City streets.** | |
| Scenario B | **Lots of them would be paved as City streets.** | |
| Scenario C | **Very little other than the growth areas around the edges where they would be paved as City streets.** | |

| | | |
|---|---|---|
| **3.a.x. What is the impact of each scenario on the south and east beltway projects?** | | |
| Scenario A | None compared to existing. | |
| Scenario B | Possibly more need for the East Beltway, also possibly creating more opposition to it by residents moving into that area. | |
| Scenario C | If the internal City becomes more congested, the need for the Beltways to move non-local traffic around the outside of town increases. | |
| **3.a.xi. What are the impacts to the congestion management program presented by each scenario?** | | |
| Scenario A | May require reconsideration of the various levels of service that have been set. | |
| Scenario B | May require reconsideration of the various levels of service that have been set. | |
| Scenario C | May require reconsideration of the various levels of service that have been set. | |
| **3.c. Transportation: Pedestrian and Bicycle** | | |
| **3.c.ii. For each scenario, quantify miles of sidewalk and costs for maintaining sidewalks for the Tier I areas.** | | |
| Scenario A | New: 216+ miles of new 5' sidewalk at a 2008 cost of $2.50 per square foot, plus 4' sidewalk on both sides of local streets. Costs for maintaining will go up a similar percentage over what we currently have. | |
| Scenario B | New: 217+ miles of new 5' sidewalk at a 2008 cost of $2.50 per square foot, plus 4' sidewalk on both sides of local streets. Costs for maintaining will go up a similar percentage over what we currently have. | |
| Scenario C | New: 136+ miles of new 5' sidewalk at a 2008 cost of $2.50 per square foot, plus 4' sidewalk on both sides of local streets. Costs for maintaining will go up a similar percentage over what we currently have. If greater walkability is planned, maintenance of existing sidewalks may need to be increased significantly. | |

| | | |
|---|---|---|
| **3.c.iv. What are the impacts to opportunities for walking and biking in each scenario?** | | |
| Scenario A | More sidewalks built, more places to safely walk. | |
| Scenario B | More sidewalks built, more places to safely walk. | |
| Scenario C | If there are fewer sidewalks built, there are less places to safely walk, though potentially shorter distances will be involved with trips which would encourage walking. More congested spaces may inhibit biking unless standards are changed to include bicycle facilities within or adjacent to existing streets. | |
| **3.d. Transportation: Energy Use, Greenhouse Gases and Emissions** | | |
| **3.d.i. In general, what are the impacts on (transportation) energy use for each scenario?** | | |
| Scenario A | Longer trips with less congestion may be the low energy use option. | |
| Scenario B | Longer trips with some congestion (&idling), somewhat higher energy use. | |
| Scenario C | If current travel habits do not change, this will result in more congestion, which means more idling time at intersections, driving up the fuel usage. If this does change travel patterns as hoped, it should result in the lowest increases of the three options. | |
| **3.d.ii. In general, what are the impacts on greenhouse gas emissions for each scenario?** | | |
| Scenario A | Spreading traffic out should reduce congestion, which will somewhat offset the longer trip lengths. | |
| Scenario B | Spreading traffic out should reduce congestion, which will somewhat offset the longer trip lengths. May be some localized congestion since the majority of development is focused to the northeast. | |
| Scenario C | If current travel habits do not change, this will result in more congestion, which means more greenhouse gas emissions while idling, offsetting the gains of shorter trip lengths. If this does change travel patterns as hoped, it should result in the lowest increases of the three options. | |

| 3.d.iii. What the potential impacts on air quality for each of the scenarios? | | |
|---|---|---|
| Scenario A | Spreading the trips around town will help to not concentrate harmful emissions. | |
| Scenario B | Spreading the trips around town will help to not concentrate harmful emissions. There may be some areas in the northeast where more congestion will occur, which would increase emissions. | |
| Scenario C | Concentrating more mobile pollution sources within the same area where the majority of the pollution is currently being generated will increase the levels seen. In the long term, this may be offset somewhat by greater transit and alternate mode usage. | |

# Lincoln Lancaster County Health Dept. Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

In general, all divisions within the Lincoln-Lancaster County Health Department would experience an increase in demand for services. Air pollution emission would also increase. How much they would increase will depend on technology and the built environment.

B. In general, what are the pros and cons of each alternative?

Scenario A- Pros, status quo (path of least resistance), utilizing existing policies. Cons, Heavy focus on single family development. Does not promote compact development with approximately 96% of new growth occurring on the fringes of the existing urban area . Will increase air pollution due to increase in trip length and corresponding increase in vehicle miles traveled. Opportunities for alternative modes of transportation will be limited due to low density development.

Scenario B – Pros, Development mainly occurring within the Stevens Creek Basin. May provide for more suitable acreage development relative to water supply and sewer. Cons, also heavy focus on single family development with only 30% identified for multifamily. Will more than likely increase air pollution due to increase in trip length and corresponding increase in vehicle miles traveled. Opportunities for alternative modes of transportation will be limited due to low density development.

Scenario C – Pros, promotes compact development with approximately 1/3 of future residential demand accommodated within the existing city. Proposes a 50/50 split of single family versus multifamily development. The higher density should allow for more mixed-use developments that promote healthy living through more walkable and socially interconnected neighborhoods. Assuming that traffic congestion is addressed and alterative modes of transportation are made available, this development scenario should create less air pollution due to generating less vehicle miles traveled.

C. What are the implications of each scenario on service provision?

Contrasted to Scenario C, Scenario A and B have the potential to have a greater impact on the level of services the Lincoln-Lancaster County Health Department provides to the community.

D. What is the impact of each scenario on maintenance and operation costs?

Contrasted to Scenario C, Scenario A and B have the potential to have a greater impact on the level of services the Lincoln-Lancaster County Health Department provides to the community.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Scenarios A and B have a greater probability of encroaching upon high pressure underground pipelines out in the county.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Background:

Based on the projections, over the 30 years, the growth by age group is:

- 0-19 increases by 29,490
- 20-64 increases by 52,427
- 65+ increases by 43,825 (from 10.9 to 18.9% of the population)

i. 65-74 will increase by 14,700 to 29,717 by 2040

ii. 75-84 will increase by 17,445 to 28,612 by 2040

iii. 85+ will increase by 11,557 to 16, 867 by 2040

There will likely be a need for more schools to meet the needs of the growing number of youths. The housing needs of the working population (20-64) depend upon whether more remain single and the size of families, which depends upon the economy and changing social norms.

Since the growth in the elderly population (65+) represents 43,825 of the projected increase of 126,000 by 2040, issues faced by this population will have a significant effect on the community:

- Over the next 15 years, the young elderly (65-74) will grow the fastest. This population will still be active in the community, perhaps with many working at least part time. They will likely be active in the community, but will start thinking about downsizing and moving to a place where they don't need to mow the lawn, repair faucets, clean the gutters.

- The health issues of the elderly and the demand for services to meet their needs will grow substantially over time. Chronic illnesses and the need for ambulatory care (doctor's visits) will increase as the elderly population ages. In the years from 2025 to 2040 the need for assisted living and nursing home services will increase dramatically as the elderly age in place and those 75+ increase in numbers.

- From 2025 to 2040, the elderly cohorts 75-84 and 85+ (frail elderly) grow dramatically. Mobility issues will mount and many of this population will need long-term care. However, it's likely that the fittest of these elderly cohorts will remain active in community activities and wish to be close to entertainment, restaurants and other services and rely on public transportation.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| 1. Urban Form | | |
| **1.a. What particular opportunities and challenges are presented by each of these growth scenarios on a neighborhood and citywide scale?** | | |
| Scenario A | Opportunities – Maintain the core downtown area. Increase employment opportunities in the downtown core area. With multi directional growth, this should help to reduce trip lengths and thus vehicle miles traveled.<br><br>Challenges – Efficiently serving the proposed development areas. Ensuring that this status quo approach to development will provide a viable community into the future. Creating neighborhoods to meet the needs of the changing demographics. | |
| Scenario B | Opportunities – Efficiently provide city services (water, sewer) to the projected growth area to help minimize the impact of development costs. Provide affordable, energy efficient housing that has good access to road networks.<br><br>Challenges – Creating neighborhoods to meet the needs of the changing demographics. | |
| Scenario C | Opportunities – Utilizing this scenarios' compact development approach, the city of Lincoln has the opportunity to create and foster a community that is viable (economically, environmentally) into the future with providing a good standard of healthy living for all residents. Creating neighborhoods that people want to live in through social interconnectedness with a sense of community.<br><br>Challenges – Addressing and overcoming the fears associated with compact development. Creating policies and/or regulations to address or eliminate impediments to redevelopment projects. | |

| | | |
|---|---|---|
| **1.b. What particular sustainability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | Opportunities – Require new housing developments to provide walkable neighborhoods with connectivity to commercial uses or amenities. Build energy efficient housing to help reduce green house gas emissions.<br><br>Challenges – With the proposed development split of 70% single family to 30% multi-family, this proposed low density development does not promote an efficient land-use. | |
| Scenario B | Opportunities – Require new housing developments to provide walkable neighborhoods with connectivity to commercial uses or amenities. Build energy efficient housing to help reduce green house gas emissions.<br><br>Challenges – With the proposed development split of 70% single family to 30% multi-family, this proposed low density development does not promote an efficient land-use. | |
| Scenario C | Opportunities – Redevelop unused or under utilized tracts of land within the city. Create multi-use developments that promote energy conservation through reduced trips thus reducing vehicle miles traveled. Multi-family structures are more energy efficient relative to heating and cooling costs.<br><br>Challenges – Alleviate concerns relative to high density/ multi use developments. Address traffic congestion concerns. Provide efficient means of alternative modes of transportation. | |
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | Opportunities – Create neighborhoods that promote a healthy lifestyle and social interconnectedness. Utilize PUD's to allow for creative developments that efficiently use land and provide a mix of uses.<br><br>Challenges – This scenario only proposes a 30% portion of new dwelling units for multi-family. May be difficult to create developments which are in close proximity to commercial uses/ amenities and employment opportunities. | |
| Scenario B | Opportunities – Create neighborhoods that promote a healthy lifestyle and social interconnectedness. Utilize PUD's to allow for creative developments that efficiently use land and provide a mix of uses.<br><br>Challenges – This scenario only proposes a 30% portion of new dwelling units for multi-family. May be difficult to create developments which are in close proximity to commercial uses/ amenities and employment opportunities. | |
| Scenario C | Opportunities – With city-wide infill slated for 17,000 dwelling units with a 50% allotment for multi-family use, this scenario is the best opportunity for creating viable developments and neighborhoods that offer a good a quality of life.<br><br>Challenges – Overcoming the stigmas associated with higher density developments. | |

## 2. Rural Form

**2.a. What particular opportunities and challenges are presented by each of these growth scenarios on a countywide scale?**

| | | |
|---|---|---|
| Scenario A | Opportunities – Utilize cluster developments to efficiently use land and preserve green space and/or valuable agricultural land.<br>Challenges – Minimizing the consumption of productive farmland. Preserving the county's natural resources and rural "feel" of the county | |
| Scenario B | Opportunities – Utilize cluster developments to efficiently use land and preserve green space and/or valuable agricultural land.<br>Challenges - Minimizing the consumption of productive farmland. Preserving the county's natural resources and rural "feel" of the county | |
| Scenario C | Opportunities – Preserve green space and productive agricultural land throughout the county. Potentially reduce vehicle miles traveled by locating rural developments close to established villages/town with amenities. Strengthen existing villages/towns in the county.<br>Challenges – Will existing towns/villages support this development scenario? Do the existing towns/villages have the capacity relative to city services to support more growth? | |

**2.b. What are the possible impacts of the scenarios on the county roads system related to the pattern of acreage development?**

| | | |
|---|---|---|
| Scenario A | With the proposed low density acreage development scattered throughout the county, the overall general impact to county roads may be less than compared to the other development alternatives. | |
| Scenario B | With the proposed low density acreage development primarily focused in the southwest area of the county, the overall general impact to the county roads in the area may be greater than compared with the impact in scenario A. | |
| Scenario C | With rural acreage development directed to occur around existing towns/villages, in theory, this scenario should have lesser impact to the county roads due to less vehicle miles traveled on county roads. | |

| 2.e.What are the sustainability issues on rural areas for each of the scenarios? | | |
|---|---|---|
| Scenario A | Access to water and wastewater treatment options are the main long term sustainability issues affecting future development in the rural areas. Each proposed rural development is reviewed on a case by case basis relative to potable water and wastewater treatment system concerns. Relative to transportation energy use, in theory, this development scenario would rank second in vehicle miles traveled. This ranking is assuming that a large majority of people work in the downtown area/ university and would more than likely access Lincoln for amenities. | |
| Scenario B | Access to water and wastewater treatment options are the main long term sustainability issues affecting future development in the rural areas. Each proposed rural development is reviewed on a case by case basis relative to potable water and wastewater treatment system concerns. Relative to transportation energy use, in theory, this development scenario would rank third (most energy intensive) in vehicle miles traveled. This ranking is assuming that a large majority of people work in the downtown area/ university and would more than likely access Lincoln for amenities. | |
| Scenario C | Access to water and wastewater treatment options are the main long term sustainability issues affecting future development in the rural areas. The capacity of existing towns'/villages' city services should be considered before future development. Relative to transportation energy use, in theory, this development scenario would rank first (least energy intensive) in vehicle miles traveled. This ranking is assuming that a large majority of people work in the downtown area/ university and would more than likely access surrounding towns/villages for amenities. | |
| 3.a. Transportation: Streets and Highways | | |
| 3.a.viii. What are the impacts of projected demographic shifts on travel patterns for each scenario? | | |
| Scenario A | Given the projected demographic shift towards a greater elderly population, this population will need to be in close proximity to amenities and health care. With a proposed multi directional development approach, it may be more difficult to meet the needs of this populations travel demands with good roads or access to alternative transportation. | |
| Scenario B | Given the projected demographic shift towards a greater elderly population, this population will need to be in close proximity to amenities and health care. With growth primarily proposed in the Steven's Creek Basin, this scenario may be the second choice to meet the needs of this populations travel demands with good roads or access to alternative transportation. | |
| Scenario C | Given the projected demographic shift towards a greater elderly population, this population will need to be in close proximity to amenities and health care. With a compact development approach, this scenario should make it easier to meet the needs of this populations travel demands with good roads or access to alternative transportation. | |

## 3.c. Transportation: Pedestrian and Bicycle

**3.c.iv. What are the impacts to opportunities for walking and biking in each scenario?**

| | | |
|---|---|---|
| **Scenario A** | Certainly, from a health standpoint including the prevention/reduction of chronic diseases, having the availability of sidewalks, crosswalks, and other attributes that lend themselves to safe walking is vital. Even though there may not be much opportunity for trails, streets can be designed such that they accommodate all types of travel including walking and biking. The complete streets or shared lane concepts lend themselves to this scenario. Ensuring that the developments are designed in such a way that walking/biking to schools is the "easy way" to get to school, and ensuring that traffic flow is designed with walker/biker safety around schools is essential. Currently, the majority of residents in developments on the fringe of the city use motorized vehicles for transportation. Design of the development to be walker/biker friendly and continued work to change transportation behaviors to include more walking/biking for trip and recreation purposes is necessary. Just from an economic standpoint, anything that can be done to encourage walking/biking as a means of reduction of chronic disease should create a significant return on investment. Currently, nearly 75% of health care dollars are spent on treatment of chronic diseases.<br><br>With as many more people as are projected, more walkers and bikers will be necessary to lessen vehicle traffic thereby reducing emissions. | |
| **Scenario B** | Scenario B: Same as scenario A | |
| **Scenario C** | The more densely populated areas do lend themselves to 'easier' opportunities to use walking or biking for trips since services, schools, churches, etc. are in closer proximity. In all scenarios, making streets friendly to all types of traffic should be considered a priority. Simple and inexpensive steps like putting bike racks at service/school points must be incorporated. Ensuring that there are adequate parks/areas for recreation also must be considered in the development. | |

## 3.d. Transportation: Energy Use and Greenhouse Gas Emissions

**3.d.i. In general, what are the impacts on (transportation) energy use for each scenario?**

| | | |
|---|---|---|
| **Scenario A** | Depending on where people work and live, this scenario generally rank second relative to transportation energy use and thus green house gas emissions. This ranking is assuming that a large majority of people work in the downtown area/ university. With the concentric growth, trip lengths very generally should fall somewhere in between scenario B and scenario C trip lengths. However, relative to access to alternative modes of transportation, this scenario generally offers the least potential for expanding access to mass transit or making the existing system more efficient. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model greenhouse gas emissions once a preferred development scenario is selected. | |
| **Scenario B** | Depending on where people work and live, this scenario generally ranks third (most energy intensive) relative to transportation energy use and thus green house gas emissions. This ranking is assuming that a large majority of people work in the downtown area/ university. With the growth occurring primarily in the Steven Creek Basin, trips lengths would very generally be the longest when comparing all three growth scenarios. However, with growth primarily occurring in one general area, access to mass transit may be possible. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model greenhouse gas emissions once a preferred development scenario is selected. | |
| **Scenario C** | This scenario proposes a citywide infill of 17,000 dwelling units versus the 2,000 proposed for Scenario A and B and an increase in density for new urban development. Assuming that traffic congestion concerns are addressed and access to alternative modes of transportation are provided, this scenario generally ranks first (least energy intensive) relative to transportation energy use and thus green house gas emissions. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model greenhouse gas emissions once a preferred development scenario is selected. | |

| 3.d.ii. In general, what are the impacts on greenhouse gas emissions for each scenario? | | |
|---|---|---|
| **Scenario A** | Relative to green house gas emissions from transportation, this scenario generally ranks second relative to green house gas emissions. This ranking is assuming that a large majority of people work in the downtown area/ university. With the concentric growth, trip lengths very generally should fall somewhere in between scenario B and scenario C trip lengths. However, relative to access to alternative modes of transportation, this scenario generally offers the least potential for expanding access to mass transit or making the existing system more efficient. Green house gas emissions from residential sources (heating and cooling) should be about the same for Scenario A and B given the identical proposed housing splits. It is generally excepted that multi-family structures are more energy efficient. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model greenhouse gas emissions once a preferred development scenario is selected. | |
| **Scenario B** | Relative to green house gas emissions from transportation, this scenario generally ranks third (most energy intensive) relative to green house gas emissions. This ranking is assuming that a large majority of people work in the downtown area/ university. With the concentric growth, trip lengths very generally should fall somewhere in between scenario B and scenario C trip lengths. However, relative to access to alternative modes of transportation, this scenario generally offers the least potential for expanding access to mass transit or making the existing system more efficient. Green house gas emissions from residential sources (heating and cooling) should be about the same for Scenario A and B given the identical proposed housing splits. It is generally accepted that multi-family structures are more energy efficient. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model greenhouse gas emissions once a preferred development scenario is selected. | |
| **Scenario C** | This scenario proposes a citywide infill of 17,000 dwelling units versus the 2,000 proposed for Scenario A and B and an increase in density for new urban development. Assuming that traffic congestion concerns are addressed and access to alternative modes of transportation is provided, this scenario generally ranks first (least energy intensive) relative to green house gas emissions. In addition, this scenario proposed a 50% portion for multi-family new housing versus the 30% proposed by scenario A and B. Therefore, in general, this scenario should produce less green house gases relative to heating and cooling of homes because multi-family structures are more energy efficient. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model greenhouse gas emissions once a preferred development scenario is selected. | |

| 3.d.iii. What the potential impacts on air quality for each of the scenarios? | | |
|---|---|---|
| Scenario A | Air quality in each scenario will be most affected by emissions from vehicles (directly correlated with vehicle miles traveled), air pollution emissions from factories/ businesses, and residential sources (heating and cooling). Given what has been discussed above regarding greenhouse gas emissions, this scenario generally ranks second relative to air quality impacts. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model all criteria air pollutants once a preferred development scenario is selected. | |
| Scenario B | Air quality in each scenario will be most affected by emissions from vehicles (directly correlated with vehicle miles traveled), air pollution emissions from factories/ businesses, and residential sources (heating and cooling). Given what has been discussed above regarding greenhouse gas emissions, this scenario generally ranks third (worst air quality) relative to air quality impacts. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model all criteria air pollutants once a preferred development scenario is selected. | |
| Scenario C | Air quality in each scenario will be most affected by emissions from vehicles (directly correlated with vehicle miles traveled), air pollution emissions from factories/ businesses, and residential sources (heating and cooling). Given what has been discussed above regarding greenhouse gas emissions, this scenario generally ranks first (best air quality) relative to air quality impacts. The Lincoln-Lancaster County Health Department's Air Quality Section will be able model all criteria air pollutants once a preferred development scenario is selected. | |

## 4.a. Natural Resources and the Environment: Air and Water Quality

| 4.a.i. What are the opportunities for mitigation of air quality issues presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | Relevant to how the development scenarios could impact air quality, the best solutions for maintaining or improving air quality are reducing vehicle miles traveled, increasing residential density through multi-family dwellings, and creating functional multi-use developments. As discussed above, scenario A falls in the middle of the three scenarios relative to its potential impacts on air quality. However, any new development in this multi directional scenario has the potential for using multi-use developments, multi-family dwellings, and providing energy efficient housing. | |
| Scenario B | Relevant to how the development scenarios could impact air quality, the best solutions for maintaining or improving air quality are reducing vehicle miles traveled, increasing residential density through multi-family dwellings, and creating functional multi-use developments. As discussed above, scenario B ranks third (worst) relative to the three scenarios for its potential impacts on air quality. However, any new development in this scenario has the potential for using multi-use developments, multi-family dwellings, and providing energy efficient housing. | |
| Scenario C | Relevant to how the development scenarios could impact air quality, the best solutions for maintaining or improving air quality are reducing vehicle miles traveled, increasing residential density through multi-family dwellings, and creating functional multi-use developments. As discussed above, scenario C ranks first (best) relative to three scenarios relative to its potential impacts on air quality. Alternative C provides the best alternative for providing denser development with a higher percentage of multi-family dwellings and good access to alternative transportation. In addition, higher density will make multi-use developments more feasible allowing residential population close access to amenities. Scenario C also has the potential for providing energy efficient housing in new developments or redevelopment projects. | |

| | | |
|---|---|---|
| **4.a.ii. What are the possible impacts of individual wastewater systems on water quality?** | | |
| Scenario A | Relative to septic systems (subsurface), there is a risk for groundwater contaminations from nitrates and other chemicals. Contamination from pharmaceutical chemicals is unknown at this time. | |
| Scenario B | Relative to septic systems (subsurface), there is a risk for groundwater contaminations from nitrates and other chemicals. Contamination from pharmaceutical chemicals is unknown at this time. | |
| Scenario C | With future development proposed around existing towns/villages, there is a greater potential for these developments to connect with city services. Therefore, the impact to groundwater quality should be lessoned. | |
| **4.a.iii. What are the opportunities for mitigation of water quality issues presented by each of the scenarios?** | | |
| Scenario A | Require the installation of lagoons versus septic systems for onsite wastewater treatment system. While lagoons are not completely enclosed systems, there is less potential for groundwater contamination. For rural acreage developments, require best management practices relative to chemical use (lawn chemicals, etc.) to minimize the risk of ground water contamination. | |
| Scenario B | Require the installation of lagoons versus septic systems for onsite wastewater treatment system. While lagoons are not completely enclosed systems, there is less potential for groundwater contamination. For rural acreage developments, require best management practices relative to chemical use (lawn chemicals, etc.) to minimize the risk of ground water contamination. | |
| Scenario C | Require the installation of lagoons versus septic systems for onsite wastewater treatment system. While lagoons are not completely enclosed systems, there is less potential for groundwater contamination. For rural acreage developments, require best management practices relative to chemical use (lawn chemicals, etc.) to minimize the risk of ground water contamination. | |

## 6.b. Community Services: Health

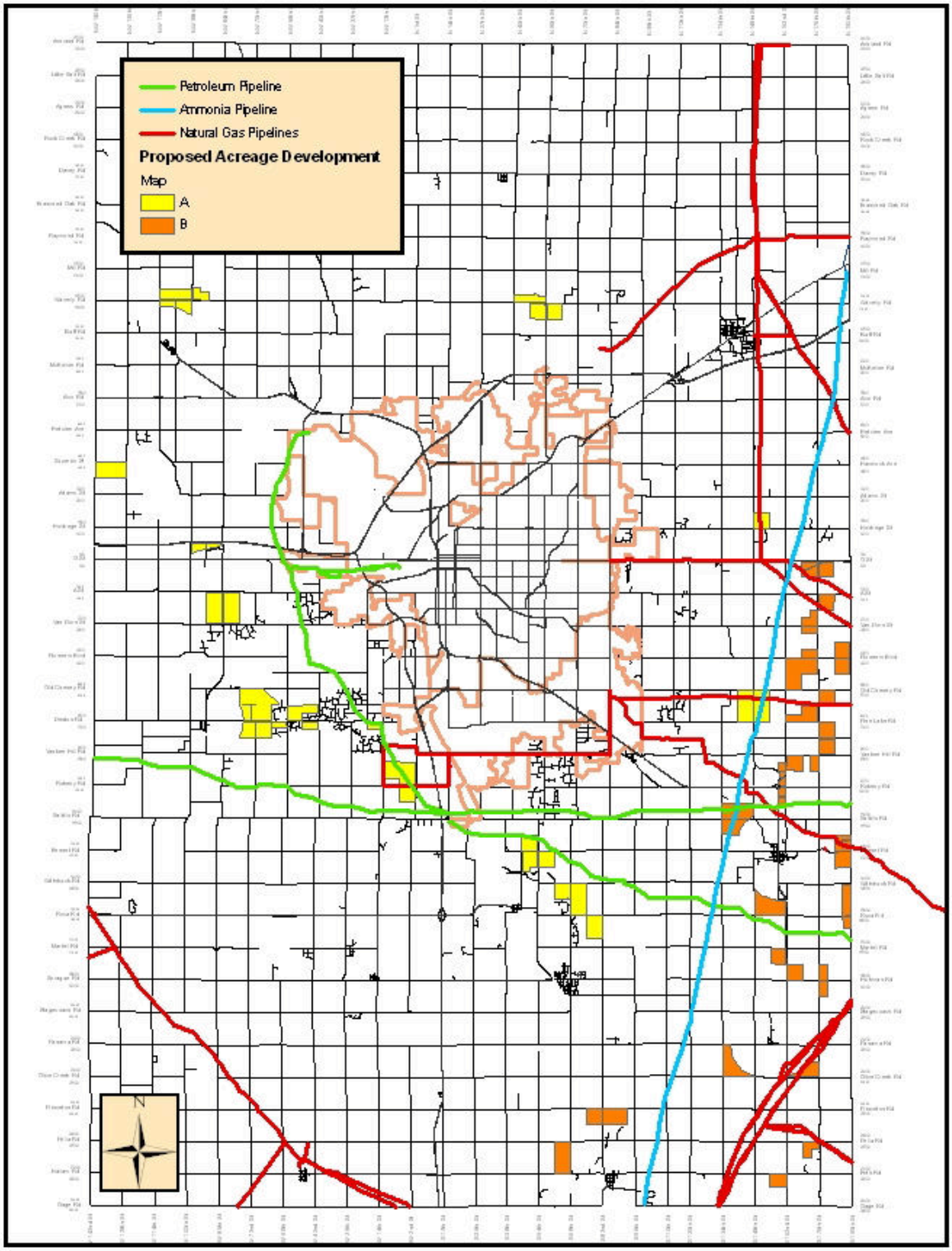
**6.b.i. What are the impacts on public health presented by each of the scenarios?**

| | | |
|---|---|---|
| Scenario A | See scenario C | |
| Scenario B | See scenario C | |
| Scenario C | Scenario C: The increased population will have a significant impact on the need for services in all areas of the Health Department as well as all other city departments. With more than 40% of the population being older adults, certainly the incidence of chronic disease has the potential to become explosive in terms of numbers and health care costs. Ensuring that the built environment encourages rather than discourages walking and biking will be imperative. Having sidewalks on both sides of the street, block lengths that are conducive to walking, available bike racks, amenities that enhance the walking/biking experience, traffic calming measures, recreation/commuter trails wide enough to accommodate the traffic, and other measures to support walking/biking are necessary. Also, it is critical to ensure that services are located within neighborhoods and are easily accessible by foot, that mass transit is available and meets the needs of the population, that schools are located in neighborhoods, that streets are built to accommodate all forms of transportation. In addition to transportation, developments should be created with the potential to have community gardens or other ways in which the public might grow some of their own produce of have access to fresh produce. | |

| 6.b.ii. What are the impacts on delivery of public health services presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | The Health Department will need to be nimble in its approach to delivering public health across the board. We must continually monitor demographics, assess greatest need, have multiple ways in which we deliver messages as well as services, change as needed, put emphasis on environment change and policy change that will promote and protect the public's health, consistently work towards changing the 'culture' of Lincoln to cause personal behaviors to support healthy lifestyles. To do this, the whole of the population must see physical activity and good nutrition as necessary parts of their lives. Citizens must also take responsibility to increase efforts to ensure a clean and sustainable environment. This recognition must be across all ages, but certainly must be instilled in youth at an early age. | |
| Scenario B | The Health Department will need to be nimble in its approach to delivering public health across the board. We must continually monitor demographics, assess greatest need, have multiple ways in which we deliver messages as well as services, change as needed, put emphasis on environment change and policy change that will promote and protect the public's health, consistently work towards changing the 'culture' of Lincoln to cause personal behaviors to support healthy lifestyles. To do this, the whole of the population must see physical activity and good nutrition as necessary parts of their lives. Citizens must also take responsibility to increase efforts to ensure a clean and sustainable environment. This recognition must be across all ages, but certainly must be instilled in youth at an early age. | |
| Scenario C | The Health Department will need to be nimble in its approach to delivering public health across the board. We must continually monitor demographics, assess greatest need, have multiple ways in which we deliver messages as well as services, change as needed, put emphasis on environment change and policy change that will promote and protect the public's health, consistently work towards changing the 'culture' of Lincoln to cause personal behaviors to support healthy lifestyles. To do this, the whole of the population must see physical activity and good nutrition as necessary parts of their lives. Citizens must also take responsibility to increase efforts to ensure a clean and sustainable environment. This recognition must be across all ages, but certainly must be instilled in youth at an early age. | |
| **6.b.iii. What are the impacts on healthy living presented by each of the scenarios?** | | |
| Scenario A | **See comments for 1.c., 3.c., 6.b.i** | |
| Scenario B | **See comments for 1.c., 3.c., 6.b.i** | |
| Scenario C | **See comments for 1.c., 3.c., 6.b.i** | |

October 8, 2010

# Acreage Development Pipelines



# Housing Authority Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Two main implications will result for the Lincoln Housing Authority: 1.) A proportional number of the increased population will be very low to low income households seeking affordable housing opportunities; and 2.) Your 70-30 split of single family vs multi-family is too high. The reason for the current rate of 70-30 split is the move of renters to single family homeownership in the 2000-2009 years depressing the need for new multi-family units during that time period and currently the demand for multi-family exceeds the supply but conservative lending has almost halted the building of needed multi-family units in Lincoln adding to a potential shortage of rental units that are affordable to the city's lower income population. I see a greater demand for multi-family rental and multi-family owner units for the foreseeable future. The cost of new construction and land as well as tighter lending practices will limit the number of single family homeownership units that will be purchased in the shortrun. We need more land zoned for multi-family construction.

B. In general, what are the pros and cons of each alternative?

Scenario A, and B will meet the needs of Lincolnites for the future, however, the need for new affordable housing opportunities in the new sections of Lincoln will be difficult to achieve, leaving the core of the city as the primary location for very low and low income households. This will mean that without aggressive code enforcement, more deterioration of the neighborhoods surrounding the core of Lincoln center. Scenario C will cause the most difficulty for lower income families if existing lower cost older units are demolished due to the expansion of the core area and are not replaced with affordable housing opportunities throughout the city. Scenario A and B would work best for lower income households only if the city would make a concerted effort though housing codes and heavy enforcement efforts to keep the older housing stock viable for lower income households.

C. What are the implications of each scenario on service provision?

Our main concern under each scenario is the preservation of the affordable housing stock that is privately owned so Section 8 Voucher holders have the ability to find good units that are within the HUD established Fair Market Rent levels. The Lincoln Housing Authority would like to see a commitment by the city for the disbursement of low income households throughout the city to eliminate concentrations of lower income households and the problems of isolation of lower income persons from the general population as a result of the concentration. Attempts to gentrify lower income areas under Scenario C, should be done without involuntary relocation of the existing tenants. The last concern is the ability of low income persons to access transportation that fits the needs of lower income workers to access jobs throughout the city of Lincoln.

D. What is the impact of each scenario on maintenance and operation costs?

I do not believe the scenario's listed will affect LHA's maintenance or operational costs. However I do believe the concentration and isolation of lower income households will result in a substantial increase in the cost of city services as well as significantly reducing the amount of private investment within the area of concentration.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios? We anticipate that HUD will continue to push for deconcentration of lower income households through funding mandates. Future funding from HUD sources may be contingent on the city's ability to create affordable housing opportunities throughout the community. Our experience has shown that affordable housing opportunities provided by LHA outside of the central core area work exceedingly well providing new job and social interaction opportunities for Lincoln's lower income families. However the financial resources of the LHA are limited and any future new affordable housing must be assisted by the city using new public/private partnerships. See F below.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

We anticipate an increased number of very low and low income households as part of the future demographic shifts and population growth. There has not been any new or additional HUD assisted housing units available to the general low income population since 2000. LHA has received very limited new funding for targeted population groups such as disabled households and for homeless veterans. We do not anticipate any new federal government funding or new programs to address the need for additional new units even though the number of very low and low income households continues to grow with the general population. We can not meet the current demand for affordable housing within the city and we will not be able to increase the number of needed affordable housing units for the future because of limited funding. The city needs to address the provision of affordable housing in any future comprehensive plan. With very little federal funding available many communities have addressed their affordable housing needs through inclusionary zoning ordinances. Many such ordinances require developers to provide affordable housing within the development to be constructed based upon a percentage of the units built.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **1. Urban Form – amount, pattern, direction, type of growth** | | |
| **1.a. What particular opportunities and challenges are presented by each of these growth scenarios on a neighborhood and citywide scale?** | | |
| Scenario A | Limited opportunities for the development of affordable housing due to higher costs of new construction. Challenge to eliminate the concentration of lower income households within and surrounding the core of the city. Without a strong code enforcement program lower cost housing opportunities within and surrounding the core could disappear. The loss of lower cost housing options for potential purchase or rental will negatively affect housing costs throughout the city. | |
| Scenario B | Same as above. Limited opportunities for the development of affordable housing due to new construction costs. Challenge to eliminate the concentration of lower income households within and surrounding the core of the city. Without a strong code enforcement program, lower cost housing opportunities within and surrounding the core area could disappear. The loss of lower cost housing options for potential purchase or rental will negatively affect housing costs throughout the city. | |
| Scenario C | This option could result in the dislocation of lower income households and the elimination of existing lower cost rental units for the low income population in Lincoln if not handled properly. The cost of redevelopment (acquisition, relocation, demolition and new construction) could negatively impact the ability to fully implement this option. I do not see this option implemented without the heavy involvement by the public sector in cost sharing and the ability to use eminent domain in conjunction with RFP's to fully effectuate new development. The shared cost to the city should be judged against the cost of providing new public services to Scenarios A and B. | |
| **1.b. What particular sustainability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | To sustain this scenario would require commitment to improved surface transportation . | |
| Scenario B | The sustainability of scenario B is limited by it's development potential. Additionally this scenario could have a negative impact on the city center core as a business and employment center. | |
| Scenario C | The ability to sustain this option will be based upon the public costs of this Scenario compared to public costs in implementing Scenarios A and B. This scenario's sustainability will rely on long term strong support by the public. | |

| | | |
|---|---|---|
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | If aggressive housing code enforcement within and around the older central core is not implemented and new affordable housing options for lower income households are not available outside of the core area, deterioration of the older housing stock could occur, resulting in future blighted areas in and around the core of the city. Livability in and around the core as a result of the blight could be negatively impacted. | |
| Scenario B | A livable and vibrant downtown would suffer under this option without development limitations on commercial property . If aggressive housing code enforcement within and around the older central core is not implemented and new and affordable housing options for lower income households are not available outside the core area, deterioration of the older housing stock could occur, resulting in future blighted areas in and around the core of the city. Livability in and around the core as a result of the blight could be negatively impacted. | |
| Scenario C | If strictly adhered to, this Scenario would provide interesting and positive long term livability opportunities. If not fully implemented or changed in midstream there might be problems with areas that have started to transition to new development but the redevelopment process was halted and not completed as planned leaving an area/neighborhood subject to further deterioration and curbed opportunities. | |
| **Public Transit** | | |
| **3.b.i. What are the impacts on the levels of efficiency of transit service delivery for each scenario?** | | |
| Scenario A | This scenario would require more and improved surface transportation opportunities than what already exist in the city. | |
| Scenario B | This scenario would require the construction of additional transit options to the central core of the city. Failure to develop these options will negatively impact the core of the city to remain the primary employment center with the city. | |
| Scenario C | This scenario would need greater public transit service delivery options within and around the city core. Affordable parking options would need to be greatly increased and provided under this option. While access to jobs and shopping opportunities may not require an automobile within the core, a car will be needed for the city core households to access or facilitate transportation destinations outside of the core area to other areas within the county, city and state or outside the state. | |

| 3.b.ii. What is the impact on costs of service delivery if the entire community, including the Tier I area, was to be served in each scenario? | | |
|---|---|---|
| Scenario A | This scenario would moderately increase costs of service delivery. Existing services in the Tier I area could be extended to new areas through incremental expansion. | |
| Scenario B | This scenario would most likely delay full development of the Tier I area. Service delivery costs and availability of services could be impacted. Demand for services to the area could strain local budgets. Would need increased development fees to cover the costs of services. This will divert costs to maintain existing neighborhoods to development of new needed services to the Stevens Creek development areas. | |
| Scenario C | This scenario would greatly facilitate the development of Tier I area without a substantial need for new services. However, some changes in how services would be provided under this scenario should be recognized. Costs extending the services will be greatly reduced. | |

# Lancaster Rural Water Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Complications will be minimal. As Lincoln annexes parts of our District, that loss of service will be shifted to other areas that we have done upgrades in.

B. In general, what are the pros and cons of each alternative?

A. From our perspective scenario A has no pros for LRWD #1. Lincoln will want to annex part of our established service area, which would be very expensive for both of us.
B. Scenario B is also a negative. Similar to A we would lose customers, infrastructure and income. Lincoln will incur added expenses due to annexation issues.
C. Scenario C would be the best option for LRWD #1. Our service area impact would be less compared to Scenarios A and B. Without knowing details maybe Lincoln could utilize present infrastructure more efficiently.

C. What are the implications of each scenario on service provision?

LRWD #1 would have minimal complications providing service with any of the 3 scenarios.

D. What is the impact of each scenario on maintenance and operation costs?

Maintenance and operation costs would be higher with Scenario C. Scenarios A and B would result in less costs due to less service area.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

In all 3 scenarios, my concern is Lincoln's approval to annexation. Certain areas are annexed, leaving us to maintain lines through annexed properties to serve those Lincoln chooses not to.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

I don't believe shifts in demographics will affect our ability to provide service. We have been able to provide upgrades in areas of high usage in a timely and efficiently fashion.

* We were having a hard time trying to understand the word “implications” as it is used in this questionnaire. We are taking it as you want to know what the possible “complications” would be. Implication means insinuations or suggestions which does not make sense as it used in this form.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **5.a. Water/Rural Water** | | |
| **5.a.vii. What are the impacts on rural water services presented by each of the scenarios?** | | |
| Scenario A | **We will be impacted by loss of service area, infrastructure and income. Our customer base would shift to other areas.** | |
| Scenario B | **Would be similar to A, but not to the same extent.** | |
| Scenario C | **Would be the least invasive of the 2 scenarios. Lincoln's cost for loss of service area would be minimal.** | |
| **5.a.viii. Are there any additional considerations presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

DRAFT Library Responses to LPlan 2040 Growth Scenarios

Prepared by Pat Leach, Library Director

9-24-10

Library Questionnaire

**A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.**

In general, we expect our overall circulation and service use to rise as the population increases.

Depending on which scenario is followed, we would expect to need additional square footage in order to manage this increase effectively. This could mean expanding current facilities, adding facilities, or rearrangement of where facilities are located. However, future changes in reading technology may mean that less library space would be taken up by printed books, and so existing buildings might be sufficient to serve this increased number of people.

Although technology continues to provide opportunities for streamlining services, our staffing and collections budgets would need to rise to meet this increase.

**B. In general what are the pros and cons of each alternative?**

Scenarios A and C could have the following pro: they might allow the libraries to provide service using our current quadrant system. Our intention with the quadrant system was to ensure that each quadrant of Lincoln had access to a certain level of library service. As the city grows, the people living on the edges of the city are farther and farther from a quadrant library. In these scenarios, with even growth along the fringes of the city, that distance would be somewhat uniform, and may not be perceived as unacceptable.

A con of this system is that with even growth, it's difficult to place an additional facility in such a way to serve an adequately large population.

Scenario B offers the advantage that, with a bulge of growth in the Stevens Creek area, there would probably be a clear need for an additional facility in that area.

An unknown with each scenario is how traffic patterns might change, and how that would impact the use of current facilities.

**C. What are the implications of each scenario on service provision?**

These are explored in the answer to B above.

**D. What is the impact of each scenario on maintenance and operation costs?**

For Scenario B, additional buildings would clearly create additional maintenance and operation costs. For example, if an additional branch library similar to Eiseley or Walt Branch Libraries were built in the Stevens Creek area, we would expect such a building to cost $10 M, and annual operating costs at $850,000 (current dollar amounts).

**E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?**

Scenario B seems to have the most impact on placement of facilities.

Some general notes:

This is a time of immense technological change in libraries. We anticipate that services such as downloadable books, mobile access, and electronic information will allow people to use the library without visiting a facility. Many libraries are experimenting with kiosks (similar to the Red Boxes that rent DVDs) in well-trafficked places to provide an alternative to a full facility. Such innovations might allow us to provide services to an expanded population without building additional facilities.

Library facilities will need to adjust as more and more books are read on electronic devices. There's a lot of discussion on how quickly this transition will happen, but not so much agreement. Libraries expect to continue to need space for some books for some time to come, as well as areas that are part of current services, such as for community gathering and meetings, areas where young children will be introduced to the love of reading, and for people to access technology and the Internet.

Our experience with branch libraries has been that people respond to a full-service branch library of the relative size and service of the current Eiseley, Gere, and Walt Branch Libraries over smaller facilities. With some limited exceptions, such as the Williams Library in the Arnold Elementary School, we would expect that any additional facility would be built using the full service model, with at least 20,000 square feet, and up to 33,000 square feet, of area.

We have had some ongoing concern regarding the location of the Anderson Branch Library in northeast Lincoln. Its location at the corner of Fremont and Touzalin Streets is not as well-trafficked as other branch libraries, and we believe that a facility for northeast Lincoln, placed on a more highly-trafficked street, would increase the amount of library use in this quadrant significantly.

Further, there is a question regarding whether the southeast quadrant of the City is currently underserved, in terms of the size of the population there. Even without extra growth in Stevens Creek, we may need to explore an additional facility in that part of the City.

**F. What are the impacts of projected demographic shifts on service provision for each scenario?**

Overall impact of projected demographic shifts:

More people in older age range.

More single-person households.

Specific Questions—Libraries.

6.f.i. Using the current library standards, what are the costs associated with providing new libraries in each of the scenarios?

Scenarios A and C, we may not need to additional buildings.

We would expect Scenario B to require a new library, and our estimate for construction and other costs is $9M in current dollars.

6.f.ii.

What are the impacts on the operating budget to provide library services in each of the scenarios?

Scenarios A and C, we would expect our operating costs to increase proportionately to the population increase and general cost of living.

Scenario B, if we add a branch library, we would expect $850,000 annual costs, based on current dollars.

6.f.iii.

What opportunities and challenges are presented by each of the scenarios?

Scenario A—If demand on library services grows to the point that an additional building is necessary, then it might be a challenge to place that building in a place where there is a concentrated underserved population.

Scenario B—The primary opportunity here is that there would be a clear section of the City where a library would likely be needed.
The challenge would be to fund a new building project and maintain annual costs associated with that. Our experience has been that a new facility greatly increases the overall amount of library use.

Scenario C—The opportunity here is that current buildings may well meet needs, without having to adjust to a great deal of underserved population along the edges of the City.

# Lincoln Electric System Questionnaire

## General Questions

**A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.**

An increase in population certainly means an increase in electrical demand. Transmission, substation and distribution infrastructure will need to be constructed to meet these new demands. Growth south of Yankee Hill Rd. will present need for new transmission lines. Growth in the Stevens Creek area south of Old Cheney Rd. will also present the need for new transmission lines.

**B. In general, what are the pros and cons of each alternative?**

**Scenario A:** Transmission lines will need to be constructed in the southern growth area and south-east area of Stevens Creek. A multidirectional approach to growth spreads construction efforts and does not utilize assets as well as a single growth front.

**Scenario B:** Transmission lines will need to be constructed in the southern growth area and south-east area of Stevens Creek.

**Scenario C:** Most difficult of three scenarios. Transmission, substation and distribution infrastructure may need updating but construction will be difficult (more disruption to the public/more expensive) in already established urban areas.

**C. What are the implications of each scenario on service provision?**

**Scenario A:** New substations and distribution infrastructure will need to be constructed to meet these new demands.

**Scenario B:** New substations and distribution infrastructure will need to be constructed to meet these new demands.

**Scenario C:** Transmission, substation and distribution infrastructure will need updating but construction will be difficult (more disruption to the public/more expensive) in already established urban areas.

**D. What is the impact of each scenario on maintenance and operation costs?**

**Scenario A:** None

**Scenario B:** None

**Scenario C:** Increase in maintenance and operation costs when dealing with higher loads on older lines and equipment.

**E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?**

- Utilization of newly constructed assets is higher if growth is on fewer fronts. This tends to help manage investment costs.
- Higher infill in scenario three presents significantly more construction issues.

**F. What are the impacts of projected demographic shifts on service provision for each scenario?**

None

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Electrical Services** | | |
| **5.d.i. What are the impacts on electrical services for each of the scenarios?** | | |
| Scenario A | **No significant impact on electrical service.** | |
| Scenario B | **No significant impact on electrical service.** | |
| Scenario C | **Transmission, substation and distribution infrastructure will need to be updated to accommodate the infill. Otherwise, equipment could become overloaded.** | |
| **5.d.ii. Are there any additional considerations presented by each of the scenarios?** | | |
| Scenario A | **None** | |
| Scenario B | **None** | |
| Scenario C | **Lines may have to be rebuilt to add capacity in older areas where load will increase. Congestion inside the city may be difficult for construction – more disruption to public; more expensive** | |

# Lincoln Fire & Rescue Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

A. Implications:

- Increase in government expenditures.
- More housing and land used for residential, commercial and industrial facilities. Higher demands in services and resources.
- Additional firefighters needed.
- Additional Infrastructure such as fire stations and fire apparatuses.
- Other expenses such as fuel and various types of supplies to conduct the department's everyday operations.
- Slower response time due to increased traffic congestion which may impede the ability to "get to emergencies more quickly".
- Increase in service demands – depleting fire, EMS and other emergency services resources.
- In order to maintain the level of service provided to existing residents, we would need more fire stations and firefighters **(It should be noted from a contemporary perspective the fire department is already experiencing significant response time challenges because city growth over the past ten years).**
- Slower response time due to extended distance from the existing fire stations.
- As the result of substantial population and city growth since the last station was built (1997) we have identified a significant deficiency in our current distribution of services. With the proposed project/Scenarios, we anticipate additional burden to our performance objectives.
- Lincoln currently has one FTE per 856 citizens, which is 186 above the current average for cities our size based upon the annual LF&R similar city survey. This number will be further exacerbated.
- If the population were to increase by 126,000 LF&R would need to add a minimum of 147 new FTE to keep the current ratio. To reach the current average ratio LF&R would need to add 188 FTE. Since it takes an average of 13.5 FTE to staff one four person rig this would indicate that LF&R needs to add somewhere between 11 and 14 companies. Since new stations could

house one engine and one aerial ladder truck, this would indicate that 5-7 new stations would be required. A commensurate number of management and support staff would also need to be added within these ratios.

B. In general, what are the pros and cons of each alternative?

B. On the positive side, we will see an increase in tax base, job and economic opportunities, other types of revenue relating to fees, fines and permits. Opportunity for immigration creating more diverse communities. For Cons see (A) above.

C. What are the implications of each scenario on service provision?

(Scenario A-B-C Compact development)

- Acquisition of land for future station sites.
- Building of the additional fire stations
- Additional firefighters, paramedics, support staff and dispatchers.
- Additional Fire Apparatus, Ambulance vehicles and Equipment.
- Expenditures relating to fleet maintenance including facilities, equipment and staffing levels.

D. What is the impact of each scenario on maintenance and operation costs?

The cost would vary based upon several different factors.

- Building green or Leadership in Energy and Environmental Design (LEED) building are more expensive front end but are more cost effective in the long run.
- Infrastructure purchases that are made to save money on the initial purchase tend to be more expensive from a longitudinal perspective.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

E. Scenario A -Multidirectional:

- Multi-directional growth would facilitate a systemic plan for response to the fringes of the city.

Scenario B – Stevens Creek:

- Adding two fire stations. One SE part of city and the other to the South. Possible relocation of a fire station.

Scenario C – Compact:

- Two additional fire station and the relocation of one existing fire station. Adding other resources (Chief Officers, Captains, Fire Apparatus operators and both Firefighter/ Paramedics and Firefighters) concentrated within the central part of the city.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

- In order to maintain the level of service provided to existing residents, we would need more fire stations, firefighters, apparatus and any other additional equipment in order to continue a reasonably consistent and reliable service.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Fire & Rescue** | | |
| **6.c.i. What are the impacts on response time presented by each of the scenarios?** | | |
| Scenario A | • Higher volume in EMS and Fire incidents.<br>• Increase in service demands – depleting fire resources. | |
| Scenario B | • Higher volume in EMS and Fire incidents.<br>• Increase in service demands – depleting fire resources.<br>• Slower response time due to distance from the existing fire stations. | |
| Scenario C | • lower response time due to traffic congestion.<br>• Increase in service demands – depleting fire resources.<br>• Slower response time due to traffic congestion impede the ability to “get there fast”. | |
| **6.c.ii. What are the impacts to the location and number of fire stations in each of the scenarios?** | | |
| Scenario A | • Increases in numbers of calls.<br>• Slower response times.<br>• As the result of exhausting the resources in place, we increase the chances of not being able to provide adequate Fire/EMS with these areas due to insufficient resources. | |
| Scenario B | • Increases in numbers of calls.<br>• Slower response times.<br>• As the result of exhausting the resources in place, we increase the chances of not being able to provide adequate Fire/EMS with these areas due to insufficient resources. | |
| Scenario C | • Compact city growth within an area tends to be heavily polluted and generate poor living conditions.<br>• Increase in service demands – depleting fire resources.<br>• Slower response time due to traffic congestion impede the ability to “get there fast”. | |

| 6.c.iii. What are the impacts to the rural fire districts in each of the scenarios? | | |
|---|---|---|
| Scenario<br>A | • Relocation of South East fire station as well as the restructuring of geographical response boundaries.<br>• Mutual Aid. | |
| Scenario<br>B | • Relocation of South East fire station as well as the restructuring of geographical response boundaries.<br>Mutual Aid. | |
| Scenario<br>C | • Mutual Aid. | |

# *LPlan 2040 Growth Scenario Response*

## *Lincoln Police Department*

The next fifty years will be a challenge for the City of Lincoln and the Lincoln Police Department. Police personnel and facility issues will be the main focus of this document. It is intended to give an overview of how the Lincoln Police Department expects to respond to up to 203,400 new residents of the city and as much as 26 square miles of land added to the urban area.

## General Personnel Projections

By 2040, it is generally assumed that 113,400 new residents will live in Lincoln, Nebraska. The Lincoln Police Department projects that we will maintain our current officer to citizen ratio, which is quite small by all national, regional and State of Nebraska standards. Using the ratio of 1.25 officers per 1,000 citizens, the 113,400 new residents will conservatively see the Lincoln Police Department increase in size by 141.75 sworn officers.

By 2060, the assumed 204,400 new residents of Lincoln will see the Lincoln Police Department increase in size by 254.25 sworn officers. Again, this calculation is based upon the 1.25 officers per 1,000 citizen's ratio, which is well below all current standards.

## Police Facility Projections

Two of the three plans, the Multi-Directional Growth and the Stevens Creek Growth Scenarios estimate 26 square miles of land added to the current urban area. Nine additional square miles of rural land is identified to satisfy the next 50 years demand for acreages. The Lincoln Police Department currently has a Team Assembly Station in the existing Capital Improvement Plan. It is widely expected that the Lincoln Police Department will, in addition to the current station planned for in the Capital Improvement Plan, have the need for one and perhaps two additional Team Assembly Stations. These stations would not ideally be placed in remote rural areas in anticipation of growth. Rather, these stations would be built within current geographical areas of the City of Lincoln, allowing for even expansion around the station, and creating a level response time to all locations served by officers assigned to that particular area.

The remaining scenario, the Compact Growth Scenario assumes 14 square miles of land added to the urban area. Although the area added to Lincoln would be much smaller than the two previous scenarios, the Lincoln Police Department would likely still have the need for one or perhaps two more Team Assembly Stations, in addition to the station in the current Capital Improvement Plan. The given population growth will increase the need for officers to be more centrally located within the geographic team areas of the Lincoln Police Department. Even with a small increase in square miles projected by this scenario, the Lincoln Police Department would want to better serve the citizens of a city of Lincoln with over 450,000 people. Putting officers in the areas they serve at the start

of their tour is the best way that that response times can be cut, while increasing officer productivity.

## General Question Responses

The overall implication of an increase of 126,000 people over the next 30 years, with 113,400 of those citizens living within the city limits has been previously discussed. This added population growth would see the Lincoln Police Department grow by 141.75 officers, on a very conservative level.

The pros and cons of each alternative have been examined by the Lincoln Police Department. At this time we do not have a particular plan we favor or disapprove of, more than another.

The implications of each scenario on services have also been previously discussed. The staffing issues and facility issues are the main areas that the Lincoln Police Department feels will directly impact police services over the next 30 years.

Over the next 30 years, each of the scenarios increases the cost of police services due to the assumed population increases and increases in facilities and personnel needed to serve the population estimates.

The issues particular to responsibilities associated with direction or type of growth in the scenarios and the projected demographic shifts would impact the police department if the growth is more compact, such as the Compact Growth Scenario. This scenario would increase the population of the existing City of Lincoln, without creating a larger "footprint". By doing so, population density would increase in many areas. More neighborhoods would need community maintenance and vigilance in an effort to prevent neighborhood decay. Codes violations would need to be addressed and increased responses by programs such as the Problem Resolution Team would be utilized at an even greater level to end issues that are of concern to the many residents of these new high density neighborhoods.

## Specific Question Responses

The impacts of response times in each of the scenarios would be minimally impacted if the number of officers and the facility issues are addressed as previously discussed. In the event that staffing is not maintained at the already conservative1.25 officers per 1,000 citizens, or if facilities are not constructed which place officers within the geographic area that they serve, response times will increase. If fewer available officers are asked to respond longer distances through more densely populated areas, response times will climb.

The impacts to the location and number of Police Assembly Stations have also been previously addressed for each scenario.

# Lincoln Public Schools Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Lincoln Public Schools recognizes the fact that Lincoln will always be considered a very vibrant community, and one that is economically established for long-term growth. The University of Nebraska, State Government, the development of Innovation Campus and a host of exceptional corporate anchors will continue to lure families to our community. Not to mention, our exceptional public school system.

B. In general, what are the pros and cons of each alternative?

As the School District continues to long-range plan, our "future" site selection purchases have been based on historically the "concentric" growth concepts as outlined by the LLC Planning Department. Options A and B continue in this direction with exception to option B eliminating an area in SW Lincoln. Lincoln Public Schools feels confident that our future growth planning is "a work in progress", but adequate to accommodate the growth patterns as presented in Options A and B. Option C provides a few more challenges in the fact that with reduced City boundary growth and a potential for an increased density of student population internal to the current boundary footprint, we could be hard pressed to find space for students. This is coupled with the facts that most existing schools have fully utilized their current sites and facilities for growth, and finding a new school site within the community could be quite difficult.

C. What are the implications of each scenario on service provision?

Lincoln Public Schools totally understands the service and service/infrastructure implications in the scenarios provided. Each has an impact on time (installation and travel), and cost (installation and operations). Options A and B would likely have significantly higher costs over the course of development than Option C. From the Districts perspective, if our community development increases in density (Option C), we have the potential to reduce transportation costs in numerous categories (i.e., student transport, distribution, maintenance, nutrition services deliveries, etc.). If our community continues to develop as it has in the past (Options A and B), then service and infrastructure costs will continue to be a higher percentage cost of planning and development.

D. What is the impact of each scenario on maintenance and operation costs?

See response to Question C.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Lincoln Public Schools has an obligation to provide educational services to every student within our community. Regardless of the growth patterns and costs of community development, we must maintain our commitment to providing quality education. Our history supports the fact that we are committed to all of our facilities regardless of geographical location, or any other factor as it relates to community growth.

Times change, as does technology (i.e., automobiles, communications, utilities, etc.), and we are always engaging in long range planning strategies that will allow us to adapt to the next challenge.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Per question C, we feel that the differences between Options A/B and Option C, are one of infrastructure costs (i.e., installation, operations and maintenance), and the long-term impact or cost reductions that can be achieved from Option C. However, this scenario doesn't come without costs as well. Existing infrastructure/services will see increased utilization and will need additional attention in a much shorter time frame. From the School Districts perspective, the increase in density will provide student housing challenges that could lead to new school concepts not familiar to Lincoln today.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **1. Urban Form – amount, pattern, direction, type of growth** | | |
| **1.a. What particular opportunities and challenges are presented by each of these growth scenarios on a neighborhood and city wide scale?** | | |
| Scenario A | **Available raw land and the automobile continue to be the significant elements that determine growth. Infrastructure project installations, maintenance and operations costs will continue to out-weigh available resources.** | |
| Scenario B | **Similar to Scenario A.** | |
| Scenario C | **This option potentially allows more financial resources to be re-allocated towards other community needs.** | |
| **1.b. What particular sustainability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

| | | |
|---|---|---|
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **Streets and Highways** | | |
| **3.a.viii. What are the impacts of projected demographic shifts on travel patterns for each scenario?** | | |
| Scenario A | **Similar to our issues today.** | |
| Scenario B | | |
| Scenario C | **This option would provide an increased need for commuter transportation options due to the increase in population density. Not uncommon to growing communities where automobiles continue to become a nuisance in commercial/business hubs. This option might also intensify development of trail/green space networks throughout the city.** | |
| **Pedestrian and Bicycle** | | |
| **3.c.iv. What are the impacts to opportunities for walking and biking in each scenario?** | | |
| Scenario A | **Community growth, regardless of the scenario option is an excellent opportunity for the community to enhance our parks, trails and green space plans. This green network can provide excellent circulation options/links for students, workers, and leisure buffs. It should be a high priority in whatever direction the comprehensive plan develops towards.** | |
| Scenario B | | |
| Scenario C | | |

| Education | | |
|---|---|---|
| **6.a.i. What are the impacts on existing schools presented by each of the scenarios?** | | |
| Scenario A | **Scenario Options A and B really don't change the Districts current school plan. It really gets more specific regarding neighborhood sustainability. As the community ages and grows, neighborhoods continue to regenerate, and re-establish themselves. This internal fabric of development is what keeps our schools operational. Lincoln Public Schools is fortunate that our community is an excellent place to live, regardless of what corner of the community you reside in. We provide new and/or maintain our school facilities consistently and comprehensively to support that lateral pressure.** | |
| Scenario B | | |
| Scenario C | | |
| **6.a.ii. What is the projected need for future school sites presented by each of the scenarios?** | | |
| Scenario A | **All of the options present challenges in their own way. To predict where families and students will end up in the future so that we can place a school facility in the middle of the group is un-realistic. What is important is that LPS is positioned in such a way that we have available property to trade our way into a good situation. We want to make good business decisions when it comes to acquiring property and building schools. Beyond that, we want to make sure we can provide the educational services that families deserve from an excellent school system.** | |
| Scenario B | | |
| Scenario C | | |

# Lincoln Water System Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

**The replacement cost of the water infrastructure that serves 250,000 people is $1.5 billion. With projected 50% growth in the next 30 years, there will be significant need for new infrastructure, in addition to replacing infrastructure nearing the end of its useful life. The current Maximum Day Demand is approximately 100 million gallons per day. By 2040 that demand will grow to 150+ million gallons per day. An additional source of water will need to be identified and plans for developing that source will need to be under way at the end of this 30 year planning period. Estimated cost for this additional source would be in the $750 to $900 million range based on a 2050 construction timeframe.**

B. In general, what are the pros and cons of each alternative?

**Since the existing water supply is delivered to the northeast side of the community, growth to the west, southwest or northwest will be the most difficult and costly for LWS to provide.**

C. What are the implications of each scenario on service provision?

**The compact growth scenario will require the least extension of infrastructure to currently undeveloped areas. Stevens Creek is the easiest of the two "status quo" scenarios to serve, as discussed in "B" above.**

D. What is the impact of each scenario on maintenance and operation costs?

**Since compact growth will require the least extension of infrastructure, there will be less area to be covered, less mile of main to maintain, and less new valves and hydrants to operate.**

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

**Replacement of aging infrastructure will need to be a priority for funding in future years. As those mains are replaced, areas that are prime for higher density (in the compact scenario) can be upgraded to larger diameter mains so that adequate fire protection is maintained. Many of the arterial traffic corridors already have larger mains via design standards. Higher densities most likely will result in fewer acres of irrigated landscape materials per capita, thus lowering the summer peaking factors that results from outdoor water use.**

F. What are the impacts of projected demographic shifts on service provision for each scenario?

**See "E" above.**

| Specific Questions - A = Multidirectional B=Stevens Creek C=Compact | | | | | | Costs (where applicable) |
|---|---|---|---|---|---|---|
| **Water** | | | | | | |
| **5.a.i. What are the impacts on system capacity of each of the scenarios?** | | | | | | |
| Scenario **A** | System capacity for Wells, Treatment, & Transmission will be identical for all 3 scenarios.<br>Distribution System capacity from northeast to southwest will need to be improved for this scenario. Such a water main will either need to go through existing built environment or around the city, in either case an expensive endeavor. | | | | | |
| Scenario **B** | System capacity for Wells, Treatment, & Transmission will be identical for all 3 scenarios.<br>Distribution System reserve capacity is greatest on the east side of the city, so this is the least expensive of the two traditional growth scenarios. | | | | | |
| Scenario **C** | System capacity for Wells, Treatment, & Transmission will be identical for all 3 scenarios.<br>Water distribution systems are designed to meet peak hour flows plus maximum fire flows simultaneously. Compact growth will most likely require less fire flow per capita, and less peak outdoor use flows in the summer. This scenario is the least expensive for the Water System. | | | | | |
| **5.a.ii. What are the differences in cost for water ~~delivery~~ distribution system improvements by scenario?** | | | | | | |
| Scenario **A** | Costs in $ Millions | Tier 1 | Tier 2 | Total | w/ 3% Inflation | |
| | Distribution System | $100 | $68 | $168 | $352 | |
| | Pump Stations | $8 | $5 | $13 | $27 | |
| | Reservoirs | $26 | $13 | $39 | $82 | |
| | Total | $134 | $86 | $220 | $461 | |
| Scenario **B** | Costs in $ Millions | Tier 1 | Tier 2 | Total | w/ 3% Inflation | |
| | Distribution System | $92 | $62 | $154 | $323 | |
| | Pump Stations | $6 | $4 | $10 | $21 | |
| | Reservoirs | $21 | $11 | $32 | $67 | |
| | Total | $119 | $77 | $196 | $411 | |
| Scenario **C** | Costs in $ Millions | Tier 1 | Tier 2 | Total | w/ 3% Inflation | |
| | Distribution System | $54 | $34 | $88 | $185 | |
| | Pump Stations | $6 | $4 | $10 | $21 | |
| | Reservoirs | $21 | $11 | $32 | $67 | |
| | Total | $81 | $49 | $130 | $273 | |

| | | |
|---|---|---|
| **5.a.iii. What are the differences in cost for water treatment system improvements by scenario** | | |
| Scenario A | **No difference in water treatment or water supply costs for any of the proposed scenarios** | |
| Scenario B | **No difference in water treatment or water supply costs for any of the proposed scenarios** | |
| Scenario C | **No difference in water treatment or water supply costs for any of the proposed scenarios** | |
| **5.a.iv. What are the differences in cost for water supply facilities by scenario?** | | |
| Scenario A | **No difference in water treatment or water supply costs for any of the proposed scenarios** | |
| Scenario B | **No difference in water treatment or water supply costs for any of the proposed scenarios** | |
| Scenario C | **No difference in water treatment or water supply costs for any of the proposed scenarios** | |
| **5.a.v. What are the differences in cost to operations and maintenance budgets for each scenario?** | | |
| Scenario A | **Water distribution O&M increase $650 thousand.**<br>**Water treatment would be the same for all scenarios.** | |
| Scenario B | **Water distribution O&M increase $625 thousand.**<br>**Water treatment would be the same for all scenarios.** | |
| Scenario C | **Water distribution O&M increase $365 thousand.**<br>**Water treatment would be the same for all scenarios.** | |

| 5.a.vi. What are the impacts to the rate structure presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | No difference in water rate structure for any of the proposed scenarios, other than the annual cost of growth related CIP projects that would need to be funded from User Fees or Revenue Bonds. New rate model will most likely be able to identify how much of the water rates are attributable to energy, personnel, equipment, capital replacements and growth. | |
| Scenario B | No difference in water rate structure for any of the proposed scenarios, other than the annual cost of growth related CIP projects that would need to be funded from User Fees or Revenue Bonds. New rate model will most likely be able to identify how much of the water rates are attributable to energy, personnel, equipment, capital replacements and growth | |
| Scenario C | No difference in water rate structure for any of the proposed scenarios, other than the annual cost of growth related CIP projects that would need to be funded from User Fees or Revenue Bonds. New rate model will most likely be able to identify how much of the water rates are attributable to energy, personnel, equipment, capital replacements and growth | |
| **5.a.viii. Are there any additional considerations presented by each of the scenarios?** | | |
| Scenario A | None | |
| Scenario B | None | |
| Scenario C | None | |

# NE Dept. of Environmental Quality Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Increased potable water demand, increased impermeable surfaces, increased pollutants loads (all types), altered hydrology, increased wastewater discharge, increased habitat fragmentation, loss of green space

B. In general, what are the pros and cons of each alternative?

*Plan A*: **Pros** - cheap land, more location options/flexibility. **Cons** - Infrastructure costs, greater loss of green space/valuable habitat, inefficient use of space, continued reliance on cars for commuting
*Plan B*: **Pros -** cheap land, focused growth. **Cons** - Infrastructure costs, loss of green space/valuable habitat, inefficient use of space, continued reliance on cars for commuting
*Plan C:* **Pros** –Focused development, less infrastructure cost, preserve undeveloped land, planning for a less petroleum based economy, agrees with results of survey. **Cons**- Reduction in single family dwellings, less location options

C. What are the implications of each scenario on service provision?

The more money spent on providing water and sewer services to fringe development means less money available for system upgrades, which will be required under current growth projections.

D. What is the impact of each scenario on maintenance and operation costs?

The more money spent on providing water and sewer services to fringe development means less money available for system upgrades, which will be required under current growth projections. However, redevelopment of existing lands can require costly upgrades; however I would expect redevelopment to be cheaper.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Urban expansion has a profound negative impact on water quality. Continued multi-directional expansion will make it difficult to focus restoration or conservation efforts effectively. While trying to protect groundwater quality and quantity considerations may include scenarios: Providing access to Public Water Systems to the greatest number of individuals, Minimizing the quantity of individual waste water systems needed, and developing the land to decrease the quantity and extent of potential contaminant sources – both point and non-point sources. This can be accomplished through any of the scenarios by employing conservation practices during the planning and construction process as well as through ordinances governing post development activities. Examples include: Placing/positioning land uses with the greatest chance of potentially contaminating in areas that possess the greatest mitigation opportunities through natural geology, position within the watershed, slope, and availability of constructing mitigation structures. Properly placing and decreasing the quantity (acres) of maintained landscapes that require fertilizer and irrigation inputs or employing ordinances to limit inputs.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

NA

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| 2. Rural Form | | |
| **2.a. What particular opportunities and challenges are presented by each of these growth scenarios on a countywide scale?** | | |
| Scenario A | Greater tax revenue as ag. land is converted to urban<br>Costly expansions of services and inefficient/incomplete development of new lands<br>A challenge will be finding a reliable safe (quality) source of drinking water for rural residential developments. This may require a larger burden upon property owners as they are required to develop their own sources of water, pool together to create/expand new/existing Rural Water Systems. | |
| Scenario B | Greater tax revenue as ag. land is converted to urban<br>Costly expansions of services and inefficient/incomplete development of new lands<br>Opportunities include already established Rural Water Systems that will require new infrastructure but considerably less when compared to Scenario A. | |
| Scenario C | Efficient land use. May be challenging for small towns allowing for acreages to expand infrastructure to new dwellings yet may also be an opportunity in increase their customer base and justify updating existing infrastructure. | |
| **2.b. What are the possible impacts of the scenarios on the county roads system related to the pattern of acreage development?** | | |
| Scenario A | **NA** | |
| Scenario B | **NA** | |
| Scenario C | **NA** | |

| | | |
|---|---|---|
| **2.d. What are the impacts of rural development on incorporated towns in each scenario?** | | |
| Scenario A | Increased revenue with new acreages, increased cost of expanding services and improving roads | |
| Scenario B | Increased revenue with new acreages, increased cost of expanding services and improving roads | |
| Scenario C | Loss of revenue due to expansions of acreages | |
| **2.e.What are the sustainability issues on rural areas for each of the scenarios?** | | |
| Scenario A | Potable water supply and adequate disposal of wastewater, potential loss of valuable habitats | |
| Scenario B | Potable water supply and adequate disposal of wastewater, potential loss of valuable habitats | |
| Scenario C | None | |
| **4.a. Natural Resources and the Environment: Air and Water Quality** | | |
| **4.a.i. What are the opportunities for mitigation of air quality issues presented by each of the scenarios?** | | |
| Scenario A | **NA** | |
| Scenario B | **NA** | |
| Scenario C | **NA** | |
| **4.a.ii. What are the possible impacts of individual wastewater systems on water quality?** | | |
| Scenario A | Rural expansion increases the number of individual wastewater systems which provides more opportunity for system failures and incomplete treatment to contaminate surface and groundwater. | |
| Scenario B | Rural expansion increases the number of individual wastewater systems which provides more opportunity for system failures and incomplete treatment to contaminate surface and groundwater. | |
| Scenario C | Limiting rural expansion will also limit individual wastewater systems, this will reduce the risk of contamination. | |

| 4.a.iii. What are the opportunities for mitigation of water quality issues presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | Urban expansion has a profound negative impact on water quality. This scenario has the greatest opportunity to cause water quality degradation in numerous watersheds while making it difficult to focus mitigation, restoration or conservation efforts effectively. | |
| Scenario B | This scenario will have substantial negative water quality impacts in the Stevens Creek watershed, however it does provide for focused mitigation efforts in that watershed. The continued development in the south Lincoln under this scenario could draw mitigation efforts away from the Stevens Creek efforts, or the impacts to those southern watersheds may be overlooked. | |
| Scenario C | This scenario will cause the least amount of disturbance to undeveloped watersheds, allowing for focused restoration efforts to be made on the already impacted urban waterways, as well as, allowing for conservation efforts to occur in the undeveloped streams. This scenario may also offer opportunities to remediate existing site with water quality issues. | |

## 4.c. Natural Resources and the Environment: Wetlands

| 4.c.i. What are the impacts associated with wetlands presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | Urban expansion has been correlated with the loss of wetland function and ecological complexity in numerous studies. This scenario has the greatest opportunity to cause wetland degradation in numerous watersheds while also making it difficult to track the extent and severity of the degradation. | |
| Scenario B | Urban expansion has been correlated with the loss of wetland function and ecological complexity in numerous studies. This scenario will have substantial impacts in the Stevens Creek wetlands, however it does provide for focused mitigation efforts in that watershed. The continued development in the south Lincoln under this scenario could draw mitigation efforts away from the Stevens Creek efforts, or the impacts to those southern watersheds may be overlooked. | |
| Scenario C | This scenario will cause the least amount of disturbance to undeveloped wetlands, allowing for focused restoration efforts to be made on the already impacted wetlands, as well as, allowing for conservation efforts to occur in the undeveloped wetlands. | |
| **4.c.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario A | This scenario has the greatest opportunity to cause wetland degradation in numerous watersheds while making it difficult to focus mitigation, restoration or conservation efforts effectively. | |
| Scenario B | This scenario will have substantial impacts in the Stevens Creek wetlands, however it does provide for focused mitigation efforts in that watershed. The continued development in the south Lincoln under this scenario could draw mitigation efforts away from the Stevens Creek efforts, or the impacts to those southern watersheds may be overlooked. | |
| Scenario C | This scenario will cause the least amount of disturbance to undeveloped wetlands, allowing for focused restoration efforts to be made on the already impacted wetlands, as well as, allowing for conservation efforts to occur in the undeveloped wetlands. | |

| 4.d. Natural Resources and the Environment: Watershed/Floodplains | | |
|---|---|---|
| **4.d.i. What are the impacts associated with watershed/floodplains presented by each of the scenarios?** | | |
| Scenario A | It is critical to understand that water quality, wetlands, and watershed/floodplains are intimately linking. The reason that these plans impact water quality is because they fundamentally alter landuse in the watershed which alters hydrologic linkages and retention times, which in turn changes the type and timing of sediment and pollutant delivery to receiving waters. The answer to 4a-d cannot be separated because they are all part of one larger system, a watershed!!! | |
| Scenario B | | |
| Scenario C | | |
| **4.d.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **4.d.iii. What plans are currently in place, or would need to be developed, to address watersheds/floodplains in each scenario?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

| 4.e. Natural Resources and the Environment: Prairies | | |
|---|---|---|
| **4.e.i. What are the impacts associated with prairies presented by each of the scenarios?** | | |
| Scenario A | NA | |
| Scenario B | NA | |
| Scenario C | NA | |
| **4.e.i. What are the impacts associated with prairies presented by each of the scenarios?** | | |
| Scenario A | NA | |
| Scenario B | NA | |
| Scenario C | NA | |

# NE Dept. of Natural Resources Questionnaire

**Note: Our response is limited to one question with water rights implications.**

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

It seems likely that a population increase of that magnitude may result in an increase in consumptive water use. Other water users in the Platte and Lower Platte Basin may also increase their use. An optional groundwater transfer permit or an optional induced groundwater recharge appropriation are among the options that could be considered by cities wishing to obtain municipal water supplies for future use. Conservation measures may also extend the use of available water supplies.

B. In general, what are the pros and cons of each alternative?

C. What are the implications of each scenario on service provision?

D. What is the impact of each scenario on maintenance and operation costs?

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

F. What are the impacts of projected demographic shifts on service provision for each scenario?

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| 2. Rural Form | | |
| **2.a. What particular opportunities and challenges are presented by each of these growth scenarios on a countywide scale?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **2.b. What are the possible impacts of the scenarios on the county roads system related to the pattern of acreage development?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **2.c. What are the impacts of each scenario to agriculture in the county?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

| 2.d. What are the impacts of rural development on incorporated towns in each scenario? | | |
|---|---|---|
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **2.e. What are the sustainability issues on rural areas for each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **4.c. Natural Resources and the Environment: Wetlands** | | |
| **4.c.i. What are the impacts associated with wetlands presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **4.c.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

| 4.d. Natural Resources and the Environment: Watershed/ Floodplains | | |
|---|---|---|
| **4.d.i. What are the impacts associated with watershed/floodplains presented by each of the scenarios?** | | |
| Scenario **A** | | |
| Scenario **B** | | |
| Scenario **C** | | |
| **4.d.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario **A** | | |
| Scenario **B** | | |
| Scenario **C** | | |
| **4.d.iii. What plans are currently in place, or would need to be developed, to address watersheds/floodplains in each scenario?** | | |
| Scenario **A** | | |
| Scenario **B** | | |
| Scenario **C** | | |

# Nebraska Department of Roads Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Infrastructure needs to accommodate population growth of 126,000.

B. In general, what are the pros and cons of each alternative?

Alternative A – Pros: Growth is occurring where major transportation infrastructure (US-77) is in place in the SW part of the city. Cons: Increased volumes due to local traffic may create unacceptable levels of congestion on existing transportation facilities. Growth occurring on east side of Lincoln would require investment in new transportation infrastructure.

Alternative B – Pros: none from NDOR's perspective. Cons: (1) This scenario does not take advantage of existing and future infrastructure (US-77) in SW Lincoln. (2) Growth occurring on east side of Lincoln would require investment in new transportation infrastructure.

Alternative C – Pros: Transit viability increases with this scenario. The use of transit or any alternative transportation accomplishes the current US DOT strategic goal to "Foster livable communities through place-based policies and investments that increase transportation choices and access to transportation services" and their goal to "Advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources". Cons: (1) This scenario does not take advantage of existing and future infrastructure (US-77) in SW Lincoln. (2) The LPLAN team discussed high density development in and around "O" street. This may cause capacity issues on "O" street. Compact growth may not necessarily reduce VMT because residents/travelers may be looking for alternative routes because of congestion on "O" street.

C. What are the implications of each scenario on service provision?

Alternative A – Takes advantage of existing infrastructure on the west side of Lincoln, growth on the south and east sides of the city may require investment in transportation infrastructure improvements.

Alternative B – Does not take advantage of existing infrastructure on the west side of the city, growth on the south and east sides of the city may require investment in transportation infrastructure improvements.

Alternative C – Takes advantage of proposed infrastructure but not until the year 2060. Does not take advantage of existing infrastructure (US-77).

D. What is the impact of each scenario on maintenance and operation costs?

On all three, maintenance and operations costs will continue to increase relative to traffic volumes and pavement condition.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Administrative oversight responsibility will increase with all three due to expansion of existing & construction of new roads.

NDOR recommends some form zoning requirements for noise abatement (or a reasonable setback from high traffic volume roads) for new housing developments to help mitigate noise impacts.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

The transportation system network must be addressed where demographic shifts are proposed.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Urban Form – amount, pattern, direction, type of growth** | | |
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….these are outside the State's responsibilities and must be determined at the community level.** | |
| Scenario B | | |
| Scenario C | | |
| **Rural Form** | | |
| **2.b. What are the possible impacts of the scenarios on the county roads system related to the pattern of acreage development?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….these are outside the State's responsibilities and must be determined at the community level.** | |
| Scenario B | | |
| Scenario C | | |
| **Streets and Highways** | | |
| **3.a.i. What are the differences in cost for street improvements by scenario?** | | |
| Scenario A | **Investment in new and improved roadways will be needed for this scenario. A financial plan to fund transportation infrastructure should be developed.** | |
| Scenario B | **Investment in new and improved roadways will be needed for this scenario. A financial plan to fund transportation infrastructure should be developed.** | |
| Scenario C | **Investment in new and improved roadways will be needed for this scenario. A financial plan to fund transportation infrastructure should be developed.** | |

| | | |
|---|---|---|
| **3.a.ii. What are the impacts to operations and maintenance budgets for each scenario?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….please see response under General Questions "D".** | |
| Scenario B | | |
| Scenario C | | |
| **3.a.viii. What are the impacts of projected demographic shifts on travel patterns for each scenario?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….To be determined in the 3-C process of transportation model development** | |
| Scenario B | | |
| Scenario C | | |
| **3.a.ix. What are the impacts to the county road system for each scenario?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….these are outside the State's responsibilities and must be determined at the community level.** | |
| Scenario B | | |
| Scenario C | | |
| **3.a.x. What is the impact of each scenario on the south and east beltway projects?** | | |
| Scenario A | **Growth predicted under this scenario will increase the need for new arterials and upgrades to the existing transportation network.** | |
| Scenario B | **Growth predicted under this scenario will increase the need for new arterials and upgrades to the existing transportation network.** | |
| Scenario C | **Growth predicted under this scenario will increase the need for upgrades to the existing transportation network.** | |

| Public Transit | | |
|---|---|---|
| **3.b.i. What are the impacts on the levels of efficiency of transit service delivery for each scenario?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….these are outside the State's responsibilities and must be determined at the community level.** | |
| Scenario B | | |
| Scenario C | | |
| **3.b.ii. What is the impact on costs of service delivery if the entire community, including the Tier I area, was to be served in each scenario?** | | |
| Scenario A | **ON ALL THREE SCENARIOS….these are outside the State's responsibilities and must be determined at the community level.** | |
| Scenario B | | |
| Scenario C | | |
| **Pedestrian and Bicycle** | | |
| **3.c.iv. What are the impacts to opportunities for walking and biking in each scenario?** | | |
| Scenario A | From a walking and biking standpoint, Scenario A (multi-directional) is virtually the same as Scenario B (Stevens Creek). | |
| Scenario B | From a walking and biking standpoint, Scenario A (multi-directional) is virtually the same as Scenario B (Stevens Creek). | |
| Scenario C | Transportation by bicycle or walking is more practical in compact urban form type development/growth. Compact type growth provides better opportunities for walking and biking. | |

| Energy use, greenhouse gases and emissions | | |
|---|---|---|
| **3.d.i. In general, what are the impacts on (transportation) energy use for each scenario?** | | |
| Scenario A | **No comment from the state perspective at this time.** | |
| Scenario B | | |
| Scenario C | | |
| **3.d.ii. In general, what are the impacts on greenhouse gas emissions for each scenario?** | | |
| Scenario A | **No comment from the state perspective at this time.** | |
| Scenario B | | |
| Scenario C | | |
| **3.d.iii. What the potential impacts on air quality for each of the scenarios?** | | |
| Scenario A | **No comment from the state perspective at this time.** | |
| Scenario B | | |
| Scenario C | | |

# NE Game & Parks Commission Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Impact on NGPC State Recreation Areas and Wildlife Management Areas around Lincoln as far as increased visitation and resulting demands on maintenance, infrastructure and law enforcement. Increase in hunting and fishing on private and other public lands in Lincoln/Lancaster County (i.e. Holmes Lake, Oak Lake, etc.) which would increase costs to Fisheries Division for fish stockings and for the Law Enforcement Division Conservation Officers for compliance checks and answering complaints from landowners/citizens and other hunters/anglers. Also, increased Lincoln office demands for service of all types.

B. In general, what are the pros and cons of each alternative?

Compact Growth Scenario would take less land out of wildlife habitat and availability for hunting than the other 2 scenarios.

C. What are the implications of each scenario on service provision?

As indicated in A. – increased demand on NGPC SRAs/WMAs in and around Lincoln/Lancaster County and at the Lincoln NGPC office as well as response by Conservation Officers county-wide due to the increase in outdoor recreation and resulting complaints.

D. What is the impact of each scenario on maintenance and operation costs?

As indicated in A. – the increase in population in and around Lincoln/Lancaster County would increase maintenance costs on SRAs/WMAs around Lincoln and increase operating costs in such areas as Parks personnel, Conservation Officers, etc.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

The Compact Growth Scenario designates no additional land for acreages other than inside the planning jurisdictions of those small towns that allow for acreages. The other 2 plans allow acreage development in other parts of the county which will undoubtedly impact SRA and WMA lands in the county it has in the past including reducing the acres of land on such areas available to hunting due to proximity of residences; negative impact on aesthetics at areas due to encroachment of housing areas, etc.; as well as increases in complaints from residents pertaining to land use or trespassing from SRAs and WMAs which will increase staff time particularly for Conservation Officers.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Unknown.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **4.c. Natural Resources and the Environment: Wetlands** | | |
| **4.c.i. What are the impacts associated with wetlands presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **4.c.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **4.f. Natural Resources and the Environment: Threatened and Endangered Species** | | |
| **4.f.i. What are the impacts associated with endangered species presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

| 4.f.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |
| **4.f.iii. What plans are currently in place, or would need to be developed, to address endangered species in each scenario?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

# Norris Public Power District Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

The Norris Public Power District currently serves the majority of Lancaster County outside Lincoln's city limits. The addition of 4,500 residential units over a 30 year time period equates to approximately 150 residential services to be added yearly. Based upon agreements between Norris PPD and LES, the majority of these electric services would be supplied by LES. The Norris PPD anticipates the addition of 4,500 residential services outside of Lincoln's city limits will have little effect on Norris PPD.

B. In general, what are the pros and cons of each alternative?

A: Pro: Service area boundary between LES and Norris PPD is effected very little.

Con: Will require some LES and Norris PPD service area adjustments.

B: Pro: None

Con: Excessive LES and Norris PPD service area adjustments.

C: Pro: This would have the least impact to the District's service area.

Con: None

C. What are the implications of each scenario on service provision?

A: Minor number of Norris PPD customers transferred to LES.

B: Greatest number potential electric customer losses to LES.

C: Least number of electric service provider changes from LES to Norris PPD.

D. What is the impact of each scenario on maintenance and operation costs?

A: None

B: None

C: None

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

The Norris District's largest concern is the loss of electric customers due to the expansion of the Lincoln city limits.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Since Norris PPD serves the rural community in Lancaster County and the expansion of the City of Lincoln involves densely populated areas that will be added to the city limits and served by LES, the Norris District sees no change in its service types in the area.  Norris PPD sees no change in the rural electrical services that we will continue to serve.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Electrical Services** | | |
| **5.d.i. What are the impacts on electrical services for each of the scenarios?** | | |
| Scenario A | **Moderate loss of Norris services to LES** | |
| Scenario B | **Large loss of Norris services to LES** | |
| Scenario C | **Small loss of Norris services to LES** | |
| **5.d.ii. Are there any additional considerations presented by each of the scenarios?** | | |
| Scenario A | **None** | |
| Scenario B | **None** | |
| Scenario C | **None** | |

# DISTRICT OR-1

Robert L. Hanger, Superintendent
425 F Street, P.O. Box 130
Palmyra, Nebraska 68418
Phone: (402) 780-5327 Fax: (402) 780-5328
Hanger.rob@districtor1.net


September 20, 2010

Long Range Planning Manager
Lincoln-Lancaster County Planning Department
555 South 10th Street
Lincoln, NE 68505

To Whom it May Concern:

On behalf of the Palmyra District OR-1 Board of Education and Administration I wish to thank you for taking the time to update us concerning the growth scenarios presented in your latest plan and for the opportunity to provide feedback.

Your request for information relating to impact for District OR-1 in relation to the three scenarios and the potential growth patterns for 2040 look to impact our district primarily in growth related to housing developments and the further construction of acreages within our current district borders. The Stephens Creek scenario would have the greatest impact for us related to the potential expansion of population along the Yankee Hill corridor to 120th street and further east through 2060. It does appear however that the time frame involved will provide the district time to plan for those eventualities as other school districts have been able to do in the past.

Thank you again for your time and consideration.

Sincerely

Robert L. Hanger
Superintendent

## Parks and Recreation

**General Questions**

A. Discuss the overall implications of an increase in 126,000 people of the next 30 years independent of the scenario.
*Assumption: 113,400 new residents within the City limits; about 33,000 new single family dwelling units*

- Neighborhood Parks: LOS 1 ac/1,000 pop.= 113 acres x $93,000/acre = $10.5 million.
- Community Parks: LOS 1.5 ac/1,000 pop.=170 acres. Two sites are currently owned by the City – 50 acres each x $100,000/acres=$5.0 M per site. The third site would involve land acquisition and development costs 70 acres x $30,000= $2.1M + $5.0M for development= $7.1 million. TOTAL=$17.1 million.
- Regional Park: land acquisition – 200 acres x $25,000=$5 million
- Conservancy/Open Space: LOS 6 ac/1,000 pop.=678 acres x $7,500 = $5.1 million using grants and donations as the primary funding source
- Outdoor pools: one community aquatics center = $5.0 million
- Recreation centers: new facilities built and operated by community partners (e.g., Lincoln YMCA)
- Street Trees: 33,000 new single family d.u.'s x 1 street tree/lot = 33,000 new street trees x $220/tree = $7.3 million funded by developers

**Pedestrian and Bicycle**

**3.c.i For each scenario, quantify the miles of trail an costs for building trails and other bike facilities for the Tier 1 areas.**

**Scenario A** 28.0 miles of new trails x $330,000/mile = $9.2 million
**Scenario B** 28.0 miles of new trails x $330,000/mile = $9.2 million
**Scenario C** 13.3 miles of new trails x $330,000/mile = $4.4 million

**3.c.iii For each scenario, qualify costs to maintenance and operations budgets for trails and bicycle facilities.**

*Assumption: Annual maintenance and operation cost per mile= $2,550*
*Annualize repair and replacement cost per year assuming 50-year life-cycle cost = $6,600*
*TOTAL annual cost per year: $9,150*

**Scenario A** 28.0 miles of new trails = $256,200
**Scenario B** 28.0 miles of new trails = $256,200
**Scenario C** 13.3 miles of new trails = $121, 700

**3.c.iv What are the impacts to opportunities for walking and biking in each scenario?**

**Scenario A** Continue standard of a trail within one mile of each residence, on average.
**Scenario B** Continue standard of a trail within one mile of each residence, on average.
**Scenario C** Continue standard of a trail within one mile of each residence, on average.

**All Scenarios**

- Interconnected system of bike routes, bike lanes, and trails.
- Bus stops integrated with trails and trailheads
- Park and Bike lots
- "Share a bike" program
- Bike commuter support facilities (ie. Bike lockers, showers)
- Bike parking for large event facilities (ie. Memorial Stadium)
- Improved Trail signage

**4.c.i What are the impacts associated with wetlands presented by each of the scenarios?**

No Comment

**4.c.ii What opportunities for mitigation of impacts may be presented by each of the scenarios?**

No Comment

**4.d.i What are the impacts associated with watershed/floodplains presented by each of the scenarios?**

No Comment

**4.d.ii What opportunities for mitigation of impacts may be presented by each of the scenarios?**

No comment

**4.d.iii. What plans are currently in place, or would need to be developed, to address watersheds/floodplains in each scenario?**

No comment

**4.f.i. What are the impacts associated with endangered species presented for each of the scenarios**

Impact is the same for all scenarios

**4.f.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?**

No comment

**4.f.iii. What plans are currently in place, or would need to be developed, to address endangered species in each scenario?**

**Scenario A** Salt Creek Tiger Beetle Habitat Plan needs to be developed and implemented.
**Scenario B** Salt Creek Tiger Beetle Habitat Plan needs to be developed and implemented.
**Scenario C** Salt Creek Tiger Beetle Habitat Plan needs to be developed and implemented.

**6.e.i Using the current park standards, what are the costs associated with providing new parks in each of the scenarios?**

| | | |
|---|---|---|
| **Scenario A** | 16 Neighborhood Parks x 4 acres = 64 acres . $93,000 = | $6.0 million |
| | 2 Community Parks (existing sites) x $5.0 M/site = | $10 million |
| | Purchase one community park site = | 2.1 million |
| | Purchase one regional park site = | 5.0 million |
| | Develop one community aquatics center = | $5.0 million |
| **Scenario B** | 18 Neighborhood Parks x 4 ac – 72 acres x $93,000 = | $6.7 million |
| | 2 Community Parks (existing sites) x $5.0 M/site = | $10.0 million |
| | Purchase and develop one community park = | $7.1 million |
| | Purchase one regional park site = | $5.0 million |
| | Develop one community aquatics center = | $5.0 million |
| **Scenario C** | 7 Neighborhood Parks x 4 ac = 28 acres x $93,000 = | $2.6 million |
| | 2 community parks (existing sites) x $5.0 M/site = | $10.0 million |
| | Purchase one community park site = | $2.1 million |
| | Purchase one regional park site = | $5.0 million |
| | Develop one community aquatics center = | $5.0 million |

**6.3.ii. What are the impacts on the operations and maintenance budget in each of the scenarios?**

**Scenario A** $515,000 Annually (see attached)
**Scenario B** $675,000 Annually (see attached)
**Scenario C** $450,000 Annually (see attached)

**6.e.iii. What opportunities and challenges are presented by each of the scenarios?**

**The same for Scenarios A, B, and C**

- Integrate school/park site development
- Integrate outdoor recreation facilities with storm water management
- Inter-connected trail, park, green space system
- Integrate sustainable features into facility development and maintenance.

6.c.ii

Annual Maint. & Operations

Neighborhood Parks = $630/acre × 4 = $2,500/pk.

Community Parks = $440/acre × 50 = $22,000/pk.

Conservancy Areas = $20/acre × 678 = $13,600 total

Com. Aquatics Centers = 0 (per SCS, Revenue covers Operations)

Annualized Repair & Replacement

Neighborhood Parks = $4,000/park

Community Parks = ~~$121,450/park~~ → $125,000/park

Conservancy Areas ⇒ 0

Com. Aquatics centers = $100,000/center

Scenario A

NP 16 × (2,500 + 4000) = $104,000

CP 2 × (22,000 + 125,000) = $294,000

RP 1 × ($20/ac* × 200 ac) = $4,000

* Maintain as conservancy until developed

AC 1 × (0 + 100,000) = $100,000

CA 1 × (13,600 + 0) = $13,600

Σ $515,600

Scenario B

$18 \times (2,500 + 4,000) = \$ 117,000$

$3 \times (22,000 + 125,000) = \$ 441,000$

$1 \times (4,000) = \$ 4,000$

$1 \times (0 + 100,000) = \$ 100,000$

$1 \times (13,600 + 0) = \$ 13,600$

$\Sigma \$ 675,600$

Scenario C

$7 \times (2,500 + 4,000) = \$ 45,500$

$2 \times (22,000 + 125,000) = \$ 294,000$

$1 \times (\$ 20/ac \times 50 ac) = \$ 1,000$

$1 \times (\$ 20/ac \times 200 ac) = \$ 4,000$

$1 \times (0 + 100,000) = \$ 100,000$

$1 \times (13,600 + 0) = \$ 13,600$

$\Sigma \$ 458,100$

# StarTran Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

An increase of 126,000 residents in the City of Lincoln over the next 30 years represents an approximate 44% increase, which will generally need to be reflected in increases in capital equipment (buses, associated equipment/facilities) and StarTran staff (particularly drivers, supervisors, and mechanics).

The location of the majority of the future growth in the urban fringe continues the current challenges being faced by StarTran, to include:

- Provision of effective/efficient service to activity/employment centers and residential development in the urban fringe. Typically such development is not designed in a "transit friendly" manner, free parking is plentiful, and is generally low-density, with areas of higher density to/from which transit services are needed.
- As the urban area grows in size, the transit trips are necessarily extended (distance and time), making public transit less desirable when compared to the private auto.
- Extended trip lengths result in increased operating costs (wages, benefits, fuel, maintenance) significantly greater than resultant revenues/fares. Such increased costs are significant issues, given state/local budget constraints and lack of dedicated funding.

The Increased transit services necessary to accommodate the transportation needs of the current and additional residents will be provided by several new service types to include:

- Evening services
- Sunday services
- Express park & ride service
- Flexible service
- Multiple transit hubs
- Increased radial grid, or grid, route designs, which will result in more transfers.

While not indicated in the associated scenario assumptions, it is understood that accommodations will be included for the expected increases in aging population. While all fixed-route services are, and will continue to be, accessible, the need for increased complementary paratransit services (HandiVan/Brokerage) will continue. Such services are very expensive, due to vehicle load constraints and operating policies and therefore, innovative variations of such services will be essential.

B. In general, what are the pros and cons of each alternative?

A) Multi-Directional Growth Scenario
Pros:

1) Continues the over-50-year policy of circumferential urban development, which utilizes the existing significant infrastructure investment and maintains the policies of emphasis on the downtown/central area as Lincoln's major employment, entertainment, and commercial area.

2) Specific to public transit, enables the continuation of the radial network, with opportunity to supplement to a modified radial/grid system to accommodate future development. Such would continue the services to the downtown/central employment, educational, and entertainment centers.

Cons:

1) Continued perimeter development, particularly of major employment and high-density residential, results in significant challenges in the provision of transit services to those developments, as previously indicated (lengthened route times, etc).

B) Stevens Creek Growth Scenario

Pros:

1) Addresses traditional demand for continued development to east, as perceived to be more desirable.

Cons:

1) Reduce viability of downtown/central Lincoln for future development. Instead, moves "center" of urban area east to Westfield/Gateway area, where roadway capacities not adequate for through traffic movements. Such capacity would result in significant effects to residential areas.
2) Would result in second transit hub in Westfield/Gateway area, with increases in transfers, capital equipment, staff, etc.
3) Would "under utilize" existing utility/roadway capacities in areas previously planned for development.

C) Compact Growth Scenario

Pros:

1) Utility/roadway capacities available to accommodate much of future development.
2) Would expect increased per capita utilization of public transit and other "alternate" modes of transportation. Result in highest level of efficiency of utilization of transit equipment, roadway capacity, utilities, etc.
3) Increased emphasis on downtown/central Lincoln as employment, educational, commercial and entertainment activity centers. But, also increase emphasis on residential in that area, instead of continued "fringe" residential development.
4) Increased emphasis on and accommodation of demand for high-density residential in downtown area.

Cons:

1) Acceptance of "Midwest" residents of high-density residential, versus traditional "fringe" development?
2) Acceptance of alternate transportation modes?
3) Acceptance of future commercial/industrial development of "compact" utilization of land proximate to current development.

C. What are the implications of each scenario on service provision?

See response to “A” regarding the Multi-Growth and Stevens Creek scenarios. Both scenarios continue to increase the current service provision issues, would continue to reduce transit’s ability to increase service efficiency/effectiveness, and would result in continued need for revisions in service provision. Multi-Growth would result in some revisions, with Stevens Creek resulting in significant such service changes. The Compact Growth scenario would be served by transit in the most efficient/effective manner.

D. What is the impact of each scenario on maintenance and operation costs?

While all scenarios would result in increased maintenance/operation costs, simply in response to increased service levels to accommodate a 44% increase in population. However, for reasons already described, the Stevens Creek scenario would have the greatest impact, Multi-Growth next, and Compact the least cost impact.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

As noted in “A”, typically fringe growth is typically not “transit friendly”; however, such growth typically includes some higher-density “pockets”, which need transit services. Provision of services to those areas is challenging, and usually is not able to be done in an efficient/effective manner. Responsibilities for provision of transit services are most effectively/efficiently accomplished in the Compact scenario.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Two demographic groups are frequent users of public transportation, the young and old.
With a projected decline in households having children could mean a decrease in transit ridership for this demographic group.

The projected increase in the 65 and over population creates challenges in service provision. This population increase will create a greater usage of demand responsive public transportation. Based on current funding levels such increase in usage could create funding challenges.

For the Multi-Growth and Stevens Creek Scenarios it is estimated, based on past history, that much of senior centers and agencies that serve the senior/aging populations will develop on the fringe of the city. This creates longer travel times for demand responsive services that will serve this population. Also, fixed route services would need to be expanded to serve these facilities as well.

Compact Growth Scenario is the best scenario to effectively serve the aging population noted above. This scenario could effectively serve this population through existing fixed route services, with little increase in costs.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Urban Form** | | |
| **1.a. What particular opportunities and challenges are presented by each of these growth scenarios on a neighborhood and citywide scale?** | | |
| Scenario A | Since most growth is on the fringe transit service would have to be extended to serve these areas or provide a second transit hub with bus routes that would originate from hub. There may be opportunities for a park-and-ride system, particular in the south area of the city. | |
| Scenario B | Since most growth is on the fringe transit service would have to be extended to serve these areas or provide a second transit hub with bus routes that would originate from hub. There may be opportunities for a park-and-ride system, particular in the south area of the city. | |
| Scenario C | With most growth occurring in the city there are opportunities for increases in ridership and enhanced services to serve this population increase. | |
| **1.b. What particular sustainability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | Since this growth scenario uses additional resources needed to serve more growth on the fringes, there may be more negative impacts on sustainability efforts. | |
| Scenario B | Since this growth scenario uses additional resources needed to serve more growth on the fringes, there may be more negative impacts on sustainability efforts. | |
| Scenario C | Since this growth scenario is using more of existing development resources there are fewer negative impacts in regards to sustainability. | |
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | This fringe type growth has not been designed for efficient transit service, and parking is generally plentiful and free, which makes public transit less attractive as a travel alternative for the public. | |
| Scenario B | This fringe type growth has not been designed for efficient transit service, and parking is generally plentiful and free, which makes public transit less attractive as a travel alternative for the public. | |
| Scenario C | This growth scenario provides opportunities for enhancing the relationship of pedestrians and bicyclists to public transportation. | |

| Streets and Highways | | |
|---|---|---|
| **3.a.v. What opportunities for efficiencies are presented by each scenario?** | | |
| Scenario A | Little, if any opportunities, for efficiencies as travel times from peripheral areas to the downtown area are long relative to driving. | |
| Scenario B | Little, if any opportunities, for efficiencies as travel times from peripheral areas to the downtown area are long relative to driving. | |
| Scenario C | There may be opportunities to increase transit ridership in areas with high density without increasing service, thereby realizing cost savings. | |
| **3.a.vi. What particular opportunities and challenges for travel demand management are presented by each scenario?** | | |
| Scenario A | None | |
| Scenario B | None | |
| Scenario C | There may be opportunities to handle increase demand in transit ridership by using existing streets and highways. | |
| **3.a.viii. What are the impacts of projected demographic shifts on travel patterns for each scenario?** | | |
| Scenario A | The projected increase in the 65 and over population will create a greater usage of demand responsive public transportation. | |
| Scenario B | The projected increase in the 65 and over population will create a greater usage of demand responsive public transportation. | |
| Scenario C | The projected increase in the 65 and over population will create a greater usage of demand responsive public transportation. A more compact growth pattern provides a better land use pattern to handle this change in demanded services with less growth on the fringes. | |

| Public Transit | | |
|---|---|---|
| **3.b.i. What are the impacts on the levels of efficiency of transit service delivery for each scenario?** | | |
| Scenario A | Since most growth is on the fringe transit service would have to be extended to serve these areas or provide a second transit hub with bus routes that would originate from hub. Also, since most transit ridership is not realized on the fringe areas, particularly neighborhood and shopping areas, there would be little efficiencies for transit service in this scenario. | |
| Scenario B | Since most growth is on the fringe transit service would have to be extended to serve these areas or provide a second transit hub with bus routes that would originate from hub. Also, since most transit ridership is not realized on the fringe areas, particularly neighborhood and shopping areas, there would be little efficiencies for transit service in this scenario. | |
| Scenario C | This scenario provides opportunities to increase levels of efficiency by increasing ridership without significantly increasing service levels. | |
| **3.b.ii. What is the impact on costs of service delivery if the entire community, including the Tier I area, was to be served in each scenario?** | | |
| Scenario A | Since most growth is on the fringe transit service would have to be extended to serve these areas or provide a second transit hub, thereby increasing costs of service delivery. | |
| Scenario B | Since most growth is on the fringe transit service would have to be extended to serve these areas or provide a second transit hub, thereby increasing costs of service delivery. | |
| Scenario C | Since most growth under this scenario is within existing city there could be lesser impacts on costs of service delivery as the level of service could be less affected. | |
| **Pedestrian & Bicycle** | | |
| **3.c.iv. What are the impacts to opportunities for walking and biking in each scenario?** | | |
| Scenario A | Since there is less transit ridership usage on the fringe areas there are fewer opportunities for walking and biking. | |
| Scenario B | Since there is less transit ridership usage on the fringe areas there are fewer opportunities for walking and biking. | |
| Scenario C | With an increase in population in the city area and an expected level of congestion there may be an increase in walking and biking as every transit trip begins with the pedestrian. An expected increase in bike racks under this scenario. | |

# Urban Development Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

- Need for jobs, estimated at 31,000.
- Where jobs are located will have implications on where people live (near work), and transportation to get there; more people may work from home and that will also impact the transportation system.
- Social service needs will grow including the homeless population. What percent of new growth will rely on public assistance to meet basic needs?
- There will be impacts to streets in the existing built environment. Considerations include: will streets be adequate? Will they need to be widened? What will be the circulation issues?
- Need to replace aging infrastructure in the built environment.
- Need to identify where facilities will be needed such as schools and parks.
- Lincoln will finally be large enough to get a _____ (fill in the blank) for retail.
- Impacts on schools: location, facilities, need for more.
- Housing choices, and where people will live.

B. In general, what are the pros and cons of each alternative?

**Scenario A:**

**Pros**: broader choice of edges.

**Cons**:

- Sprawl.
- Increased cost of utilities.
- Not meeting changing market demand for housing types and location.
- Overall ability to provide services such as fire, police, stormwater, etc. more difficult and expensive.
- All public investment is on the edges and the built environment is largely ignored.
- Creates more urban flight with new housing available on the edge
- Less likely to have affordable housing

**Scenario B:**

**Pros:**

- Easier to get on east beltway and get to Omaha faster.
- From a regional perspective, it continues to close the Lincoln-Omaha development corridor.

**Cons:**

- Same as Scenario A.
- Most limited choice of development for housing.

**Scenario C:**

**Pros:**

- Compact growth – more sustainable and energy efficient.
- More efficient use of existing infrastructure uses public dollars more efficiently. Not as much new sewer, water, and streets has to be built.
- Creates more housing choices.
- Creates the opportunity for more affordable housing.
- More opportunities for public transportation alternatives – more feasible transit usage as a result of densities.
- Healthier, more walkable.
- More efficient accommodation for change in household types.
- Encourages reinvestment in the built environment, both public and private.
- Preserves agricultural land.
- Preserves/protects natural resources.
- Encourages more vibrant neighborhoods.
- Better reflects the Downtown Master Plan for housing.
- Shorter commutes to work, home, recreation.
- Increased population to use existing community centers.
- Cheaper for the City to provide all services including police, fire, and schools.
- Affordable housing choices are more critical with higher density.
- More city funds are available for infrastructure maintenance in the built environment if not building new roads, sewer and water on the edge.
- Meets the need for a new generation of urbanites and the market demand for new housing choices.

**Cons:**

- Fear of higher density because of the negative impacts of some unplanned density in older neighborhoods.

C. What are the implications of each scenario on service provision?

Scenario C is more cost effective for all services.

D. What is the impact of each scenario on maintenance and operation costs?

Scenarios A and B are more costly with little to no funds left over for maintenance of the existing built environment. Scenario C is most cost effective.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

We do housing and redevelopment. We are limited by funds, not need, which affects all scenarios but Scenario C in particular. If there is flight to the edge, which is likely with Scenarios A and B, it results in stratification of housing. Broad choices are on the edge of the city but those with limited resources stay in the core which intensifies economic stratification. When that occurs, people don't want to live in the "poor" area so it, the economic process, becomes a cycle. That is why we need a choice of housing and housing prices, to accommodate all income levels. If not, the result is geographic and economic stratification.

More tools are needed for redevelopment besides just TIF. The incentive we have is tied to circumstances that do not match implications of growth in this fashion. If we want to grow in this way, and complete projects in areas that are not low- and moderate-income, more tools are needed.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

If there are more non-family households, it affects all 3 scenarios. Smaller non-family households lend themselves to greater density. Increasing elderly housing could be on the edge but income affects housing choice. If elderly housing is on the edge, services will need to follow: health services must be dispersed; response time for emergency services is increased.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Urban Form** | | |
| **1.a. What particular opportunities and challenges are presented by each of these growth scenarios on a neighborhood and citywide scale?** | | |
| Scenario A | Less density, auto oriented | |
| Scenario B | Same as A | |
| Scenario C | Reinvestment occurs in the built environment; stronger neighborhoods; more transportation alternatives. | |
| **1.b. What particular sustainability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | Maximizes auto usage. Passive solar energy could be better utilized in new growth areas. | |
| Scenario B | Same as A | |
| Scenario C | More public transportation options; savings in utility costs; concentration of limited funds | |
| **1.c. What particular livability opportunities and challenges for the urban area are presented by each of the growth scenarios?** | | |
| Scenario A | Creates concentration of lower income people in the core. Easier with a clean slate to develop new neighborhoods on the edge of the city. | |
| Scenario B | Same as A | |
| Scenario C | More walkable neighborhoods; badly managed density problem; more viable retail centers in the built environment; create places where people want to live and work; establish healthy lifestyle – more walking, biking, less dependence on automobiles. | |

# Wastewater Questionnaire

## General Questions 10-4-10

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

Based on current flow rates per person an increase of 126,000 people would mean an increase of 12.6 million gallons per day of wastewater flow to the treatment plants. The net total increase required in treatment capacity would be approximately 5 MGD to 10 MGD based on where the growth occurred in the city. Based on today's costs the plant capacity expansion could be as much as $120,000,000. Based on the 2007 Wastewater Master Plan an additional treatment plant would not be required until the developed area served by the Theresa Street Treatment Plant reached 75,000 acres. The proposed 2040 Comprehensive Plan identifies 64,000 acres of growth through 2060. A storage facility may be needed late in Tier II dependent upon the timing and location of growth.
With the potential of increased clean water regulations limiting nitrogen and phosphorous discharges plant improvements will be required. Technology and the actual regulations will determine the costs of meeting the new regulations.
There will also be additional pressure on wastewater reuse due to limited water supplies and the need for conservation and sustainability of the operation.

B. In general, what are the pros and cons of each alternative?

A. Multi-directional 40% TSTP 60%NETP
Pro. The split of the loading of the treatment plants stays the same with improvements being adjusted to fit the 1.2% growth rate.
Con. Additional collections system must be built in all areas of the city to provide service to the growth areas. This requires additional funding to install more feet of sewer to service the areas.

B. Stevens Creek 30% TSTP 70% NETP
Pro. The growth is more contained in one area and both treatment and collection improvements can be built in one basin and one treatment plant.
Con. The NETP will have to be expanded faster than what was planned.

C. Compact Growth 54% TSTP 46% NETP
Pro. Treatment plant improvements will be made as planned at the individual treatment plants because the flow ratio between the treatment plants will remain basically the same. There will be minimal trunk sewer construction required since the existing system will not be expanded substantially.
Con. Depending on where the internal or fill in growth occurs some existing sewers may have to be increased in size to increase flow capacity. This effort will have to be coordinated with current selective replacement projects.

C. What are the implications of each scenario on service provision?

A. Multi-directional: The collection system will have to be expanded in all directions to serve the new areas.
B. Stevens Creek: The collection system will be targeted to basically a single basin and will be able to expand faster than the multi-directional since funding will be able to be targeted to minimal number of basins.
C. Compact Growth: Because of a reduced service area, the targeted areas will be able to be served with less funding and smaller rate increases than the other scenarios.

D. What is the impact of each scenario on maintenance and operation costs?

For Wastewater treatment: All the scenarios will have roughly equivalent operation and maintenance costs because funding and efforts will be directed to whatever plant is receiving the flows.
For collection :

A. Multi-directional will have increased maintenance and operation costs since there will be more trunk sewers installed requiring cleaning and maintenance to serve the identified area.
B. Stevens Creek will have less operation and maintenance costs than “A” because there will be less feet of trunk sewer installed to maintain in serving the identified area.
C. Compact will have the least operation and maintenance cost because it has the least number of feet of collection sewers installed to maintain.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

All three scenarios hold the same issues regarding WW responsibilities regardless of direction or type of growth.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

Demographic shifts will not impact the service provision for Wastewater for any of the scenarios.

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Wastewater** | | |
| **5.b.i. What are the impacts on system capacity of each of the scenarios?** | | |
| Scenario **A** | This scenario will require the largest increase in capacity requirements for both treatment and collection systems of all three scenarios. The collection system will have to be expanded in all directions to serve the growth areas requiring more feet of collection system to be installed. Both plants will probably have to be expanded to some degree because of increased wastewater flows to both plants and increased Inflow and Infiltration flows due to a large collection system (more pipe in the ground). | |
| Scenario **B** | This scenario will have less impact on capacity requirements for both treatment and collection than Scenario A.<br><br>Fewer trunk sewers will be necessary to serve the growth areas in this scenario compared to Scenario A due to the emphasis on one drainage basin. Also due to less pipe install there will be less flow from Inflow and Infiltration to the treatment plants requiring less treatment capacity. The bulk of the increase in wastewater flows will be directed to the Northeast Treatment Plant and the expansion can be concentrated at the Northeast Plant rather than doing construction at both plants. | |
| Scenario **C** | This scenario will have the least impact on collection and treatment capacity of the three scenarios.<br><br>This scenario has the least amount of trunk sewers necessary to serve the city while requiring some of the exiting old sewers to be replaced or upsized to provide capacity to existing areas. Both of these actions will decrease inflow and infiltration reducing flows to the treatment plants limiting the capacity requirements for treatment to wastewater flows. Both treatment plants will require some expansion under this scenario. | |

| **5.b.ii. What are the differences in cost for wastewater collection system improvements by scenario?**<br><br>**Estimates were made for each scenario based on the Current Wastewater Master Plan. Each Tier's estimate was divided by the number of years in the Tier for an average cost per year the costs were escalated at 3% annually. The annual costs were then totaled to derive a total collection cost for each tier in each scenario.** | | |
|---|---|---|
| **Scenario A** | Scenario A has a current cost of $269 million. Tier I current cost is $165 million. assuming that this will be spent over a 30 year period provides an average annual expenditure of $5.5 million escalating this at a 3% annually the total cost for the 30 year period is $276 million The Tier II current cost is $104 million. Assuming that this will be spent over a 20 year period starting in 2041 provides an annual average cost of $2.09 million and escalating this at 3% starting today provides a total Tier II cost of $131 million. Adding the tier costs together for a total escalated cost of $407 million. | |
| **Scenario B** | Scenario B has a current cost of $254 million. Tier I current cost is $149 million. Assuming that this will be spent over a 30 year period provides an average annual expenditure of $5.0 million escalating this at a 3% annually the total cost for the 30 year period is $251 million The Tier II current cost is $105 million. Assuming that this will be spent over a 20 year period provides an annual average cost of $2.11 million starting in 2041 and escalating this at 3% starting today provides a total Tier II cost of $133 million. Adding the tier costs together for a total escalated cost of $384 million. | |
| **Scenario C** | Scenario C has a current cost of $148 million. Tier I current cost is $81 million. Assuming that this will be spent over a 30 year period provides an average annual expenditure of $2.7 million escalating this at a 3% annually the total cost for the 30 year period is $136 million The Tier II current cost is $66 million. Assuming that this will be spent over a 20 year period provides an annual average cost $1.33 million starting in 2041 and escalating this at 3% starting today provides a total Tier II cost of $82 million. Adding the tier costs together for a total escalated cost of $218 million. | |

**5.b.iii. What are the differences in cost for wastewater treatment system improvements by scenario?**
**All estimates are based on 2010 costs escalated at 3% annually to expected time of construction. There are approximately $38 million of plant improvement projects that will be required regardless of growth in each scenario.**

**Scenario A**

**The estimated cost for Scenario A wastewater system improvements is $795 million**

| | Tier I | Tier II | Total |
|---|---|---|---|
| TSTP | $406 million | $48 million | $454 million |
| NETP | $28 million | $313 million | $341 million |
| Total | $434 million | $361 million | $795 million |

**Scenario B**

**The estimated cost for Scenario B wastewater system improvements is $599 million**

| | Tier I | Tier II | Total |
|---|---|---|---|
| TSTP | $37 million | $265 million | $302 million |
| NETP | $130 million | $167 million | $297 million |
| Total | $167 million | $432 million | $599 million |

**Scenario C**

**The estimated cost for Scenario C wastewater system improvements is $447 million**

| | Tier I | Tier II | Total |
|---|---|---|---|
| TSTP | $164 million | $68 million | $232 million |
| NETP | $157 million | $58 million | $215 million |
| Total | $321 million | $126 million | $447 million |

**5.b.iv. What are the differences in cost to operations and maintenance budgets for each scenario?**
**All O& M cost estimates are in 2010 $, Costs will increase as personnel, equipment and collection system is added.**

**Scenario A**

The annual treatment O&M cost for Scenario A is $.9 million/yr
The annual collection O& M cost for Scenario A is $.8 million/yr
The total estimated annual O& M cost for Scenario A is $1.7 million/yr

**Scenario B**

The annual treatment O&M cost for Scenario B is $.9 million/yr
The annual collection O& M cost for Scenario B is $.8 million/yr
The total estimated annual O& M cost for Scenario B is $1.7 million/yr

**Scenario C**

The annual treatment O&M cost for Scenario C is $.6 million/yr
The annual collection O& M cost for Scenario C is $.45 million/yr
The total estimated annual O& M cost for Scenario C is $1.05 million/yr

| 5.b.v. What are the impacts to the rate structure presented by each of the scenarios? | | |
|---|---|---|
| Scenario A | The rate structure will not be affected but this scenario will increase the wastewater rates the most of the three scenarios. | |
| Scenario B | The rate structure will not be affected but this scenario will increase the wastewater rates more than scenario C. | |
| Scenario C | The rate structure will not be affected but this scenario will increase the wastewater rates the least of the three scenarios. | |
| **5.b.vi. Are there any additional considerations presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

# Watershed Management Questionnaire

## General Questions

A. Discuss the overall implications of an increase of 126,000 people over the next 30 years, independent of the scenario.

- Need to complete a unified watershed master plan for the City as well as design and construction of related watershed master plan projects
- Will require increased drainage maintenance needs as well as the inspection/enforcement of more detention/retention ponds

B. In general, what are the pros and cons of each alternative?

Scenarios A & B (multi direction and Stevens Creek)
- Pro: Development in the New Growth Areas that will not stress smaller existing infill systems. Development in the New Growth Areas provides for an opportunity for new subdivisions to develop in a more sustainable manner (LID, cluster, open drainages, large open areas, etc)
- Con: Can cause an increase in stream destabilization and pollution issues to natural areas due to urbanization. There will be pressure to grow into floodplains and attempts to revise the existing natural drainage systems

Scenario C (compact)
- Pro: Redevelopment of infill areas in the Existing Urban Area provides an opportunity to 'depave' or provide less impervious area (i.e. the chance to do more sustainable redevelopments)
- Con: If redevelopment leads to increased impervious areas, this will cause more problems to drainage systems in the Existing Urban Area, some of which are already undersized

C. What are the implications of each scenario on service provision?

For Scenarios A & B, there will be an impact on services as although many of the larger systems will be private (i.e. open systems) there will be a significant increase in smaller public drainage systems that will need to be maintained

For Scenario C there will a lesser impact as there will be a correspondingly smaller increase in construction of new drainage systems in the New Growth Area. If redevelopment in the Existing Urban Area is done in such a manner that the impervious area increases there will be increased stress on the existing drainage system that will lead to an increase in maintenance needs

D. What is the impact of each scenario on maintenance and operation costs?

Scenarios A & B would have more of an impact on maintenance and operation costs than Scenario C. All three scenarios of development will bring about additional private detention/flood storage facilities. If that detention/flood storage becomes unusable or otherwise fails the delineated flood plain could be altered, therefore continued diligence in seeing that these facilities are inspected and maintained will increase future costs.

E. Are there issues particular to your responsibilities associated with direction or type of growth in the scenarios?

Responsibilities would increase for drainage and floodplain review of subdivisions for Scenarios A & B in regards to development in the New Growth Areas. For Scenario C responsibilities would increase for resolving drainage, utility conflict and redevelopment issues in the Existing Urban Area.

F. What are the impacts of projected demographic shifts on service provision for each scenario?

None

| Specific Questions | | Costs (where applicable) |
|---|---|---|
| **Wetlands** | | |
| **4.c.i. What are the impacts associated with wetlands presented by each of the scenarios?** | | |
| Scenario A | From the National Wetland Inventory there is a higher density of wetlands in the New Growth Areas as compared to the Existing Urban Area. There will be more of an impact on wetlands with Scenarios A & B than with C | |
| Scenario B | See Scenario A | |
| Scenario C | Not as significant of an impact as Scenarios A & B as there is an increase in development with Scenario C in the Existing Urban Area | |
| **4.c.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario A | If development is done in a sustainable manner in this Scenario than there should be opportunities for avoidance, minimization and mitigation as the infrastructure and potential utility conflicts should be minimal | |
| Scenario B | See Scenario A | |
| Scenario C | For redevelopment in the Existing Urban Area there may be less environmental impacts as the areas are mostly built out. For those areas that are in need of mitigation there will be less opportunity due to the infrastructure and utilities already in place | |
| **Watershed/Floodplains** | | |
| **4.d.i. What are the impacts associated with watershed/floodplains presented by each of the scenarios?** | | |
| Scenario A | Many of the watersheds (except for east and northeast) have been master planned for drainage concerns. As long as present ordinances regarding New Growth Areas and stormwater are followed than the impacts should be kept to a manageable level for the higher flood events. Ordinances still need to be passed to manage more frequent (lower) events to assist with water quality and stream stability | |
| Scenario B | See Scenario A | |
| Scenario C | There will be an impact for redevelopment in the Existing Urban Area if redevelopment is accomplished in an unsustainable manner (i.e. increase in impervious area). This will stress the existing drainage systems, of which some are already undersized | |

| | | |
|---|---|---|
| **4.d.ii. What opportunities for mitigation of impacts may be presented by each of the scenarios?** | | |
| Scenario A | If development is done in a sustainable manner (following existing ordinances and managing the more frequent storm events) than impacts can be kept to a manageable manner as with the New Growth Area ordinances there should be minimal development in the floodplain | |
| Scenario B | See Scenario A | |
| Scenario C | If redevelopment causes an increase in impervious area there will be associated increases in flooding and floodlain creep for the Existing Urban Area. There are several thousand homes in the floodplain and increases in impervious area with associated redevelopment will only cause greater stress on the watersheds related to flooding, water quality and stream stability | |
| **4.d.iii. What plans are currently in place, or would need to be developed, to address watersheds/floodplains in each scenario?** | | |
| Scenario A | A plan is in place to develop a unified watershed master plan for the City of Lincoln and surrounding growth areas. Areas not yet master planned include mostly internal urban drainages that drain directly to Salt Creek and watersheds east and northeast of Lincoln. It is planned to master plan these areas for drainage in the future in coordination with Planning on expected future development | |
| Scenario B | See Scenario A | |
| Scenario C | See Scenario A | |
| Stormwater | | |
| **5.c.i. What are the differences in cost for public stormwater conveyance and storage improvements by scenario?** | | |
| Scenario A | Costs should be lower for public drainage systems in this scenario as much of the larger drainages will be privately maintained (open systems) due to the present stormwater and floodplain ordinances | |
| Scenario B | See Scenario A | |
| Scenario C | If redevelopment does not increase impervious areas than costs will be low as drainage from redevelopment will use existing systems without causing increased impacts. If redevelopment does increase impervious areas than the cost will be greater as this will cause systems already under capacity to become worse and make for a greater need for replacement and rehabilitation of existing systems | |

| | | |
|---|---|---|
| **5.c.ii. What are the impacts to operations and maintenance budgets for each scenario?** | | |
| Scenario A | This will significantly impact O&M as although many of the larger systems will be private (i.e. open systems) there will be a significant increase in smaller public drainage systems that will need to be maintained | |
| Scenario B | See Scenario A | |
| Scenario C | This will impact O&M to a lesser degree than Scenarios A & B as there will a correspondingly smaller increase in construction of new drainage systems in the New Growth Area. If redevelopment in the Existing Urban Area is done in such a manner that the impervious area increases there will be increased stress on the existing drainage system that will lead to an increase in maintenance needs | |
| **5.c.iii. What are the potential impacts on existing stormwater handling in each of the scenarios?** | | |
| Scenario A | Under the present ordinances the urbanization of New Growth Areas will lead to increased destabilization of streams, increased pollutant levels and more frequent smaller flooding events. This indicates a need to pass water quality control standards to assist in minimizing these impacts | |
| Scenario B | See Scenario A | |
| Scenario C | If redevelopment of the Existing Urban Area is done in a sustainable manner than the impacts to the existing stormwater handling system should be minimal. However if not done in a sustainable manner (i.e. an increase an impervious area) than there will be significant potential impacts to the existing stormwater handling system, that will include the need for repair and replacement as well as result in increased localized flooding | |
| **5.c.iv. Are there any additional consideration presented by each of the scenarios?** | | |
| Scenario A | | |
| Scenario B | | |
| Scenario C | | |

# SCHOOL DISTRICT 145

Including Communities of Alvo, Eagle, Prairie Home, Walton, and Waverly

*"Inspire our students to seek excellence in their lives."*

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Michael DeKalb
Lincoln\Lancaster County Planning Dept
Lincoln, NE 68508

Dear Mr. DeKalb,

Thank you for allowing an opportunity to provide feedback regarding the Lincoln/Lancaster County Long Range Comprehensive Plan. As Lincoln continues to grow, so too will the communities served by School District 145. As more housing units are built closer to Waverly and Eagle, we believe our school district will continue to attract parents and students, thus the growth pattern of our district will continue.

After reviewing the information, we believe that a comprehensive plan which emphasizes growth in a multi-directional pattern is advantageous.

Scenario A and C allow the city of Lincoln to reinvest in its core areas, which will be a future key to maintaining a vibrant and attractive city, and maintaining population patterns that support the school district infrastructure already invested in by Lincoln Public Schools. This should reduce the costs for additional infrastructure by utilizing existing resources and facilities.

We believe that allowing rural communities to expand by allowing the opportunity to develop acreages and other housing units surrounding those communities is preferable. This will allow Lancaster County to continue its growth, while enhancing the property value for the county and rural school districts. This growth in housing and property valuation would allow the communities of School District #145 to be responsible for the education of students, while maintaining the integrity of our primary source of revenue (property). This allows our rural school district to offset a portion of the eventual loss of property value to the Lincoln Public School district as the city of Lincoln's boundaries expand eastward. Growth in smaller communities will allow rural residents to determine how to expand their facilities and infrastructure to accommodate the population growth. Thus, the initial burden is lessened for the city of Lincoln and Lincoln Public Schools.

We agree with the results of the Community Planning Survey that indicates Growth Scenario B is not as favorable because the focus is one-directional development, mainly in the Steven's Creek area. This would limit expansion of the city of Lincoln towards one particular area, and not provide the advantages of the multi-directional Scenario A or compact Scenario C.


District Office
14511 Heywood Street, PO Box 426
Waverly, NE 68462
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We appreciate the opportunity to present comments, and look forward to future conversations regarding the growth and development of Lincoln/Lancaster County. Rural communities are beneficiaries of these developments, and we will work together to meet the needs created by these developments.

Sincerely,

Bill Heimann, Ed. D.
Superintendent

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Fax: 402-786-2799

# Addendum

## Department Responses



Lincoln/Lancaster County Planning Dept.
555 S. 10th Street, Ste. 213
Lincoln, NE 68508
402-441-7491
lincoln.ne.gov

NEBRASKA
GAME PARKS

**Nebraska Game and Parks Commission**
2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641 • Fax: 402-471-5528

October 27, 2010

Mike DeKalb
Lincoln-Lancaster County Planning Department
555 S 10th St
Lincoln, NE 68508

Dear Mr. DeKalb:
Enclosed are comments from Nebraska Game and Parks Commission staff regarding the City of Lincoln and Lancaster County growth scenarios. We appreciate the Lincoln-Lancaster County Planning Department's efforts to involve us in the planning process. We hope our participation in this process will assist in reducing future wildlife-related issues and conflicts that can arise as a result of growth, development, and expansion.

Thank you for the opportunity to comment and for your consideration in this matter. If you have questions or need any additional information, please feel free to contact me at (402) 471-5438 or michelle.koch@nebraska.gov.

Sincerely,

Michelle R Koch

Michelle R. Koch
Environmental Analyst Supervisor
Nebraska Natural Heritage Program
Nebraska Game and Parks Commission

CC: Lincoln-Lancaster County Planning Department (Michele Abendroth, Nicole Fleck-Tooze, Sara Hartzell)

Nebraska Game and Parks Commission (Jim Douglas, Scott Taylor, Jeff Hoffman, Rick Schneider, Pat Molini, Mark Vrtiska, Mike Fritz, Sam Wilson, Ted LaGrange)

Enclosure (1)

**Lincoln and Lancaster County Growth Scenarios**
**Comments from Nebraska Game and Parks Commission Staff**

**Wildlife Nuisance and Depredation, Hunting, Trapping, and Wildlife Management Areas**
In many states in the Eastern U.S., where urban sprawl is greatest, wildlife nuisance and depredation issues have become increasingly more the responsibility of municipalities as they grow and engulf more and more wildlife habitat. State wildlife agencies tend to get less involved due to lack of budgets and staffing and then can only provide technical advice to address urban wildlife problems. Common management tools such as hunting and trapping by the public which are less expensive and perhaps more acceptable are often replaced with professional sharpshooting and professional trapping, alternatives that are expensive and maybe more controversial. For urban Canada geese, programs that remove nuisance birds can also be expensive and as or more controversial and may require permitting from the U.S. Fish and Wildlife Service (Service) and Nebraska Game and Parks Commission (Commission). With continued expansion, municipalities are likely to suffer unanticipated expenses and deal with contentious issues relating to nuisance complaints about urban wildlife. Thus, from a wildlife management standpoint, Scenario C – Controlled Growth – would be the most desirable option. Regarding small mammals and sometimes even deer, some allowance of trapping with euthanasia to protect property is needed. It is not legal to release trapped wildlife if it has been moved more than 100 yards in most cases. Euthanasia is often the best option due to the threats of transporting disease, extreme territoriality in many species and the released animal becoming a problem for someone else. Although squirrels and turkeys have been relocated, translocated turkeys and squirrels have caused problems in the past. Allowing multiple trap types in order to address problems should also be considered. New types of traps such as "species specific traps" have been designed to trap raccoons and opossums but will not trap dogs or cats. Issues dealing with urban threatened and endangered species will require assistance from the Service and Commission.

Many municipalities manage controlled hunts to keep costs down, especially for deer. Allow for hunting of deer in areas of the City of Lincoln with deer. Allow maintenance hunting to take place from the start when deer are first detected in an area. Don't let deer get habituated to urban habitat.

10 deer per square mile is probably a good goal in areas with deer currently. 10 deer become 100 deer in 4-5 years.

Three areas within the City of Lincoln with deer issues, in order of how severe: Wilderness Park, Airport vicinity/N14th and Boosalis Park. Population estimates for these areas are probably at 40-50 deer per square mile currently. Problems usually start occurring when densities get over 20 deer per square mile in urban areas.

Urban development on the East has been dense enough to push deer out. To continue this trend is desirable with growth that does not allow deer to get overpopulated and/or habituated to living in urban habitat.

If development encroaches on deer habitat, maintenance hunting should be practiced immediately. Don't wait for the law suit, be proactive. The controversy is best dealt with now when the process of hunting is less noticeable than when a larger effort is needed. Often sharpshooting is first needed before maintenance hunting can be effective. The sharpshooting portion of deer reduction is often the most controversial and most expensive.

Keep urban growth away from Wildlife Management Areas and State Recreation Areas. Hunting with a rifle is illegal within 200 yards of an inhabited dwelling. It is desirable that development around Game and Parks Areas be kept away from property lines at least 200 yards. The ability to manage wildlife numbers on these areas with hunting and trapping is crucial. Other methods used to manage wildlife numbers are ineffective and/or expensive. These areas are paid for and managed with funds provided by user groups that use them such as hunters, trappers and campers.

**Threatened and Endangered Species**

Lancaster County is within the range of the following threatened and endangered species and critical habitat: Salt Creek tiger beetle (*Cicindela nevadica lincolniana*), Salt Creek tiger beetle critical habitat, saltwort (*Salicornia rubra*), and western prairie fringed orchid (*Platanthera praeclara*).

Growth Scenario C has the least impact on natural areas, which in turn poses the smallest threat to these species, because additional development will be largely within the existing city limits, and urban sprawl is limited. Therefore, from a threatened and endangered species standpoint, this is the best alternative. However, as stated below, there are still concerns with some aspects of Scenario C regarding development south of Arbor Road near Little Salt Creek.

The Salt Creek tiger beetle is endemic to saline wetlands and associated streams and tributaries of Salt Creek in the northern third of Lancaster County, Nebraska. It occurs in exposed mud flats of saline wetlands and along mud banks of streams and seeps. Channel-straightening and residential, industrial, and agricultural development resulted in degradation, loss, and fragmentation of saline wetland and stream habitats that the Salt Creek tiger beetle relies on.

Saltwort is a state endangered plant that grows in a narrow range of habitat within the saline wetlands. It is found growing primarily on moist, saturated, clay mudflats. Saltwort generally grows in heavy soils with high salinity levels that inhibit other plants from growing in their wetland habitat. In Nebraska, it is known only from the saline wetlands of Lancaster County and Phelps County.

In respect to the Salt Creek tiger beetle, saltwort and saline wetlands, the Growth Scenarios have done a good job of maintaining the current planning approach of not promoting development in the floodplain of Little Salt Creek drainage north of Arbor Road. However, in all three scenarios, development is proposed south of Arbor Road adjacent to Little Salt Creek and one of the few remaining Salt Creek tiger beetle populations and Critical Habitat. Development in this area has the potential to have significant impact to the Salt Creek tiger beetle and Critical Habitat through changes in hydrology, run-off, erosion, pesticide use, and light pollution. It is recommended that development in this area be limited to a minimum of 1500 feet from Little Salt Creek and the associated saline wetland habitat.

Growth Scenario A has one proposed low density acreage development within the Little Salt Creek watershed. Critical Habitat and several remaining populations of Salt Creek tiger beetle exists within the Little Salt Creek watershed. Saltwort is also found in these areas. Any additional development in this area could adversely impact both species by direct loss of habitat and by altering the hydrology and salinity of the Creek and saline wetlands in this area. There is concern that development of one acreage in this area would pave the way for additional

development and urban sprawl in this area. In general, efforts should be made to avoid development that would affect the hydrology and salinity of Salt Creek and its tributaries, and all saline wetlands within Lancaster County. Once these habitats are destroyed, it is very difficult and expensive to mitigate for the losses and/or restore them. Therefore, from both an ecological and economical standpoint, it is better to leave existing, natural habitats for these species in tact.

Western prairie fringed orchid is a state and federally listed threatened species. Western prairie fringed orchid occurs in native tall or mixed-grass prairies that are associated with wet meadows. The plant can be a colonizer species and grow on disturbed areas, but it is found in greatest abundance on high quality prairie. Declines in western prairie fringed orchid populations have been caused by the drainage and conversion of its habitat to agricultural production, channelization, siltation, road and bridge construction, over-grazing, and the application of herbicides.

There are populations of western prairie fringed orchid and tracks of native tallgrass prairie throughout Lancaster County. Growth Scenario A has proposed low density acreages planned near Denton. Although there are no proposed housing developments south of Denton at this time, there is concern about continued sprawl and expansion south of Denton towards Spring Creek Prairie. Fire and grazing are two mechanisms used to manage Spring Creek Prairie. As more and more housing developments inch closer to and surround large tracks of prairie, it becomes increasingly difficult to mange this habitat using fire and grazing. Nine Mile Prairie, to the northwest of Lincoln, faces similar urban sprawl encroachment.

Growth Scenario B proposes several low density acreage developments on the south, east, and southeast sides of Lincoln. There are some small tracks of tallgrass prairie in these areas as well, and continued development threatens the existence of these natural areas.

Regardless of which growth scenario is chosen, it is likely more water will be consumed as the population increases. Since Salt Creek is a tributary of the Lower Platte River, additional surface water and groundwater use and development within the Salt Creek Watershed could alter the hydrology of the Lower Platte River. In turn, decreased stream flow in the Lower Platte River may have an adverse impact on threatened and endangered species within the Lower Platte River, including Pallid Sturgeon (*Scaphirhynchus albus*), Interior Least Tern (*Sternula antillarum athalassos*), Piping Plover (*Charadrius melodus*), Lake Sturgeon (*Acipenser fulvescens*), and Sturgeon Chub (*Macrhybopsis gelida*). For additional water use (both ground and surface water), a water offsetting mechanism will need to be developed in order to mitigate for these impacts.