Mayor's Road Design Standards Technical Task Force

FINAL REPORT

May 13, 2008

Task Force Charge Statement

One of the most important functions of city government is to provide a safe and efficient system of streets and roads. This process involves design, phasing, traffic synchronization, construction and maintenance, achieved in the most cost effective manner possible.

The Mayor's Road Design Standards Technical Task Force is hereby charged to evaluate the standards for roadway design and construction looking at current design standards and industry practices. The Task Force is asked to ratify existing procedures or to make recommendations to the Mayor and Council that propose to amend, refine or change such processes.

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TASK FORCE FINDINGS

There are a limited amount of funds to complete all the desired road projects in the future Street Network plan of the 2030 Lincoln/ Lancaster County Comprehensive Plan.

In order to stretch public and private funds and still get many roads surfaced, the City should seriously consider a simplified and less costly designs for some road projects. Design elements of each road should be based on the potential future traffic, current and future adjacent land uses, while also considering city wide priorities. A phased approach, while stretching funds, will still facilitate eventual urban four lane construction.

Even with the proposed phasing approach for the intermediate time period, the City should continue to aggressively pursue new revenue sources for road funding.

The Task Force supports the Rural Urban Transition Streets (RUTS) approach that the City and County have approved through an Interlocal Agreement.

Urban streets are more expensive than rural roads because of elements necessary to serve heavier traffic, storm water runoff and pedestrian needs found in an urban environment. Elements such as storm sewers, curb and gutter, street lights and sidewalk serve urban traffic and residential neighborhoods but add costs compared to a rural cross section.

Building roads today to handle traffic volumes that won't exist on the road for decades – is viewed as a luxury the City can't afford under current conditions. In times of limited funds, the public needs to "get by with less." So some roads will <u>not</u> initially have items such as center turn lanes, dual left hand turns, right hand turn lanes, long tapers, storm sewer or concrete paving in order to build more streets throughout the city.

Changes in road types do not necessarily diminish public safety. Some changes in standards may result in more driver inconvenience and increased travel times, but are not unsafe. Given limited funds, driver expectations for traffic to flow unimpeded is outweighed by the need to pave more streets and link our transportation system to immediate needs created by a growing city. The public may experience some delays, but there are not enough funds to build every road to the future standard. So, in order to make sure that more urban roads are at least surfaced, the recommendation is for a simpler standard for some roads.

The longer term implications for maintenance are an important consideration. Some road types may be less expensive to build, but are somewhat more expensive to maintain. These recommendations try to strike a balance between current construction costs and future maintenance costs. For example, an asphalt street may wear out in 15 years and need to be resurfaced, but there is still an initial cost saving compared to a concrete street and long term savings in life cycle costs. In addition, the asphalt can be a part of the future road base when it is converted to an urban street.

TASK FORCE RECOMMENDATIONS:
OVERALL APPROACH:

1. **Use Different Road Types in the Interim:** The Task Force recommends using several different road types in the interim in order to stretch road funds. This approach proposes roads be built to four different road types over the next six to ten years. In addition, in many places where there is an existing rural asphalt road, the recommendation is to keep the existing surface, while adding turn lanes in some locations to increase capacity, extend the useful life of the road and defer the expenditure of public funds. (A map showing the proposed road standards along with the potential cross sections are shown at the end of the report.)

   The four road types were labeled A, B, C and D which are summarized as follows (see guidelines at the end of report on page 7 for more details):

   Type A – (Red color) standard conversion of a two lane road to a four lane urban arterial street with turn lanes.

   Type B – (Orange) designed for near term conversion to 4 lanes; the street will start as 2 lanes, but will need to be 4 lanes within 15 years due to projected traffic volumes.

   Type C – (Purple) designed as 2 lane road with turn lanes anticipating that road may have 2+ lanes for 15 or more years. While it will have only two through lanes for longer period of time, the street is still designed to allow expansion to 4 lanes in future.

   Type D – (Blue) is built similar to rural "RUTS Phase I" standards and could include either concrete (Type D1) or asphalt surfacing (Type D2). It should be used toward the edge of urban development where there are few commercial uses along the street and it will probably have lower traffic volumes in the 2030 planning period. The design allows expansion to 4 lanes in future.

2. **Interim Road Type Map**: The attached map recommends four different Road Types for specific streets in the 2030 Street Network. This map recommended by the Task Force takes into account projected future traffic and land uses, as well as prioritizing some projects. For example, the map shows that some projects such as a) Old Cheney Road from 70th to 84th Street, b) S. 56th Street from Old Cheney Road to Pine Lake Road and c) N. 14th from Superior to Fletcher Avenue should be widened to Road Type A – the City standard 4 lanes plus turn lanes. However, other roads such as Alvo Road or Rokeby Road would only be improved to a more rural standard (proposed Road Type D.)

   This map is an interim near term step and does not supercede the 2030 Road Network in the Plan. Due to funding constraints, there is also no guarantee that any of the roads shown on this map will be built during the next 6 to 10 years. The map should serve as an intermediate vision for within the next ten years. It should be reviewed annually, or as

needed, and should be fiscally realistic. The Task Force should be reconvened to review and make recommendations on any alterations or revisions to the map and/ or report. This review should be done early in the process of the preparation of the annual Capital Improvement Program (CIP). The recommendation of the Task Force should also be forwarded to the Planning Commission for their consideration with the CIP.

This report, including the Road Type Map and cross sections will be approved by the Mayor by Executive Order. Any alterations or revisions, once reviewed by the Task Force, will require amending the Executive Order.

3. **Impact Fee Reimbursement:** The compromise recommendation of the Task Force was that impact fees could be used to reimburse Type A, B and C streets, if built with concrete surfacing and Type D streets if built with concrete or asphalt surfacing. Road types A, B, C and D will be built to meet minimum state and federal standards. (The Road Types A, B, C and D1 and D2 shown in the appendix do meet state and federal standards.)

4. **Establish a Group to Review Design Disputes:** The City should reconvene the Task Force as a standing committee to work with Public Works & Utilities and Planning Department staff. This group could advise the Mayor on updating the Executive Order, reviewing the draft CIP, and considering disputes between the public and private sector on road design standards. This would save considerable time and money compared to the longer process such as having a subdivision and road design appealed to the City Council.

TASK FORCE RECOMMENDATIONS: SPECIFIC DESIGN ELEMENTS

5. **Ponded Width Standard**: City should use a 6 foot ponded width (spread limit) which saves on storm sewer costs since it requires fewer storm sewer laterals and inlets. This standard was recently used on South 98th Street, south of Pine Lake Road and there was a significant reduction in the storm sewer costs. This standard handles a 10 year storm while still permitting drivers to continue near design speed without hydroplaning. The current standard is a 4 foot ponded width. Nationwide, there is not a consistent standard on ponded width with examples given from Illinois, Texas and New Jersey and each state having a different standard.

6. **Design Speed:** the City agreed to design arterial streets for the posted speed limit, rather than designing for 5 mph over the speed limit. Federal regulations would allow designing roads for their posted speed limit rather than 5 miles per hour over the speed limit – which can result in significant savings in road grading. The Nebraska Department of Roads is also considering this change as well.

7. **Surfacing:** The compromise recommendation was that Public Works and Utilities would allow asphalt surfacing on Type D2 streets, but would not allow asphalt surfacing to be used on Type A, B and C streets. Road types A, B, C and D will be built to meet minimum state and federal standards. In the past, some asphalt roads such as Pine Lake Road and Old Cheney Road have successfully handled urban traffic for more than a decade. If these roads had turn lanes they might have been able to handle even more traffic. When a two lane asphalt road is offset the road can stay open when the future two urban lanes are added. This type of road is used by other cities and state agencies and serves the public well and at less cost.

8. **Two Lane Offset: –** there was agreement that City and County should build two lanes offset to one side to permit two through lanes to be added in the future without tearing up the initial two through lanes. The added cost of grading the right-of-way now for four future lanes and building the two lanes offset is a wise investment.

9. **Reuse of Old Asphalt: –** Public Works and Utilities agreed that in the future when a rural road is converted to an urban section the old asphalt road can be integrated into and serve as a base for the new permanent pavement. This is done in other states and saves on material costs. This approach would allow the asphalt to be reused rather than removed. This approach is incumbent on the initial two lanes being built to appropriate urban standards for vertical profile for sight distance.

10. **Separate Grading and Paving Contracts –** Public Works and Utilities agreed to explore having separate bid contracts for grading and paving. Developers have experienced lower bids on the grading work when it was separate from paving and this may save the City some money as well.

11. **Turn Lanes –** Public Works and Utilities agreed to consider varying the length of turn lanes and tapers depending upon adjacent land uses and proposed turning movements. This will save some funds compared to having 250 foot minimum long turn lanes at every intersection with a local street. There was agreement that turn lanes at intersection of two arterial streets is always desirable.

12. **Develop a Set of Standards for Road Base Design–** Road base, soil type and pavement design are very important considerations for the long term and shouldn't be skimped on in the near term. Spending a little extra on the road base in advance saves tremendously in the long term. Every base should be considered individually, but in reality the City may find that about 4 to 5 designs will work in most every situation.

13. **Should Acquire Ultimate Right-of-Way (ROW) Needs Now –** The City and County should acquire and grade the right-of-way for the ultimate road needs in advance to minimize disruption to adjacent land in future. It is also more economical to buy full ROW needs now than in the future.

14. **Strategic Use of Roundabouts May Limit Need for Turn Lanes and Signals –** Such as Yankee Hill Road between 14th and 27th Street.

15. **Asphalt Shoulder –** as long as there is a good aggregate base, a 4 foot wide shoulder of 1 and ½ inch thick asphalt on top of an aggregate base can provide a good long term solution and be less costly than full depth concrete. Interstate 80 was built with a 1 and ½ inch asphalt shoulder as part of a 13 inch aggregate base that lasted for 25 years with heavy traffic before resurfacing. A shoulder, where there is not a curb, is important to avoid rutting and avoid steep drop offs for the driver.

ROAD TYPE GUIDELINES & DESCRIPTION

The decision on which road type should be used for a given road should consider several factors. Consideration should be given to factors such as future traffic volumes, adjacent land uses, proposed 2030 number of lanes and overall street priorities. The Task Force recommends these Road Types for the next 6 to 10 years (2008 to 2018) given limited financial resources while still providing for the ultimate number of lanes and design as shown in 2030 Comprehensive Plan.

ROAD TYPE A

1. Full urban street with 4 through lanes, median, left and right hand turn lanes with storm sewer and sidewalks. This type is appropriate for streets that currently have over 10,000 trips per day and are anticipated to have over 20,000 trips per day in the future.

ROAD TYPE B

1. Anticipated that street will start at 2 lanes, but will need to be 4 lanes (Road Type A) within 15 years due to projected traffic volume

2. Significant commercial land uses are shown in Comprehensive Plan adjacent to street

3. **More than 20,000 trips per day** are projected according to 2030 traffic models

4. Construction: 3 lanes urban – 2 lanes "suburban style" on either side of 28 foot wide median so that turn lanes are built in advance, since it will go to 4 + turn lanes within 15 years

ROAD TYPE C

1. Due to funding limitations, build a "2+1" street anticipating that road may have only 2 through lanes with turn lanes for 15+ years. The road should be designed to allow expansion to 4 lanes in future.

2. Some commercial uses are shown adjacent to the street in the Comprehensive Plan, but not they significant traffic generators

3. Approximately **12,000 to 20,000 trips per day** are projected according to 2030 traffic models (maximum threshold for 2 lane street with turn lanes). Potentially 9,000 trips or more for roads in commercial and industrial areas.

4. Construction: 2 lanes plus turn lanes – find ways to avoid continuous mile long turn lane

ROAD TYPE D

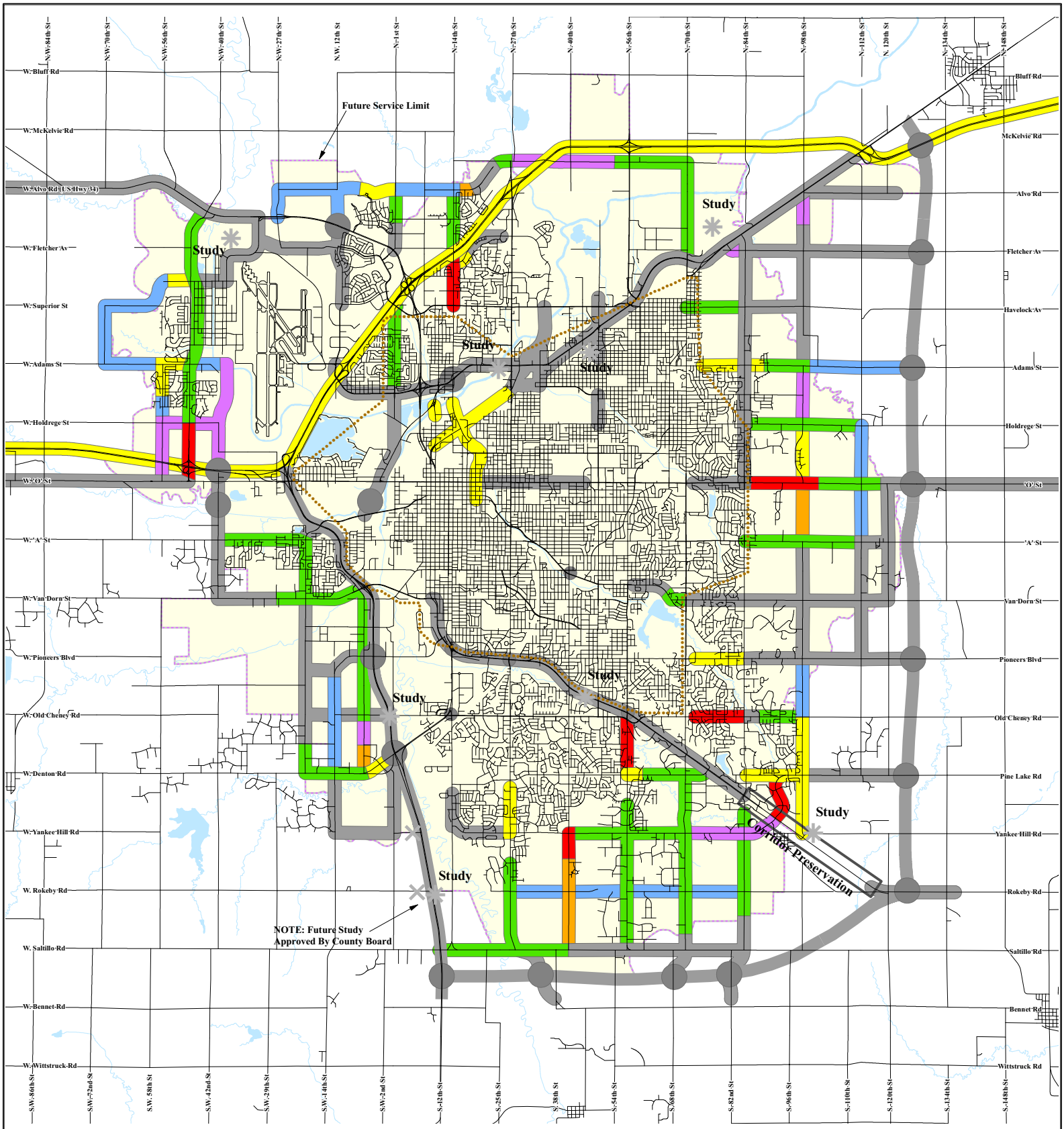
1. Use inside city limits at edge of urban development, where there are few commercial uses along the street anticipated and could include either concrete (Type D1) or asphalt surfacing (Type D2).

2. Anticipate that road will serve projected traffic volume for at least 15 years (2023)

3. **Less than 12,000 trips per day** are projected according to 2030 traffic models

4. Construction: RUTS Phase 1 road with asphalt turn lanes added at intersections and sidewalk on one side – road is still designed to allow expansion to 4 lanes in future.

EXISTING SURFACE+: Use current road plus some improvements at intersections. For example, for rural roads where that are currently a two lane asphalt road, add asphalt at intersections to provide a center turn lane. For urban roads, such as the intersection of Normal Boulevard and Van Dorn Street, make intersection and turn lane improvements to add capacity.



SIX TO TEN YEAR ROAD TYPES

Mayor's Road Design Standard Task Force Recommendation

- Type A: Urban 4 Lane
- Type B: 2 Lane Suburban
- Type C: 2 + Turn Lanes
- Type D: RUTS Phase I
- Existing Surface Plus
- Committed or Complete
- Other Projects Listed in 2030 Comp Plan

LINCOLN - LANCASTER COUNTY PLANNING DEPARTMENT

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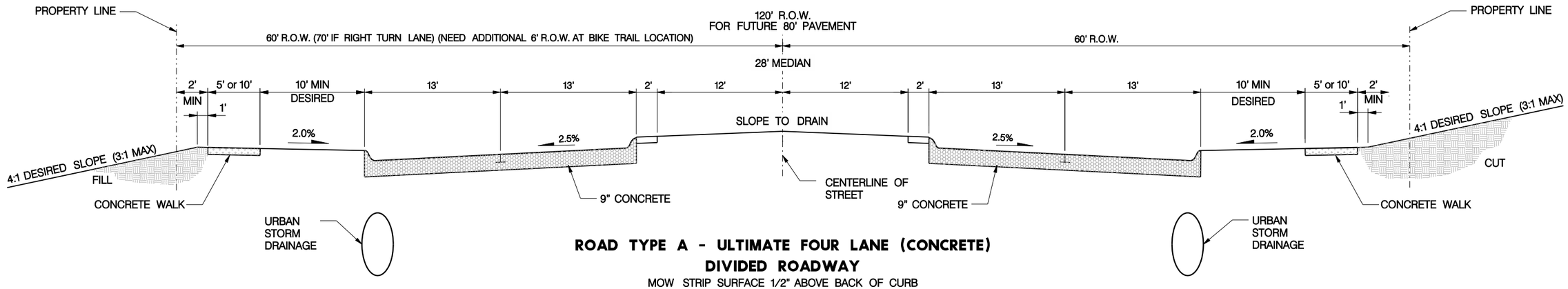
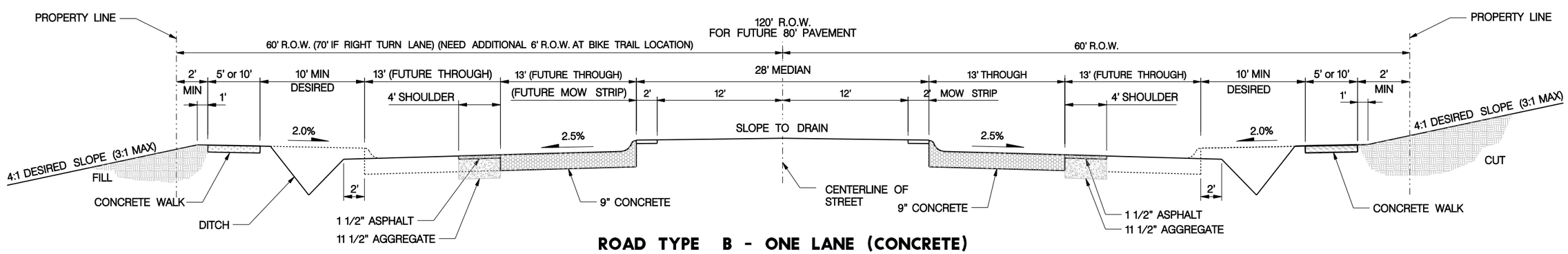
APPENDIX FOR MAYOR'S ROAD DESIGN TASK FORCE



ROAD TYPE A - ULTIMATE FOUR LANE (CONCRETE) DIVIDED ROADWAY

MOW STRIP SURFACE 1/2" ABOVE BACK OF CURB



ROAD TYPE B - ONE LANE (CONCRETE) ON EACH SIDE OF A RAISED MEDIAN

MOW STRIP SURFACE 1/2" ABOVE BACK OF CURB

SHEET 1 OF 2
PAVEMENT SECTIONS

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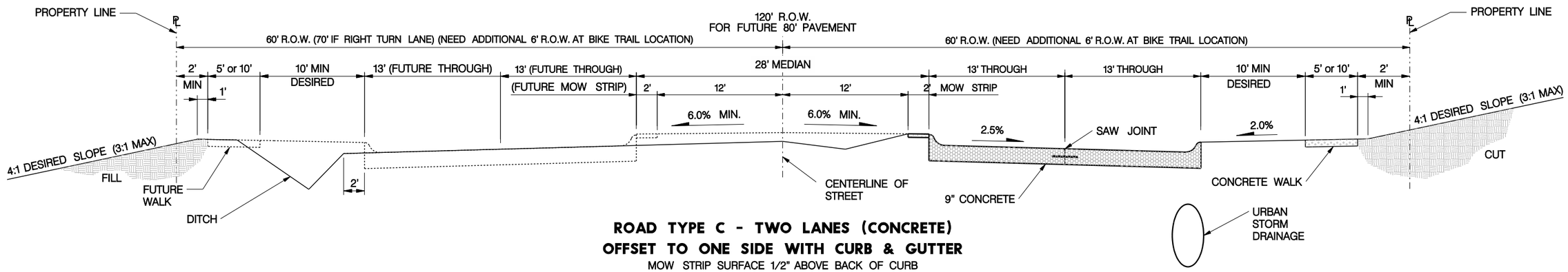

ROAD TYPE C - TWO LANES (CONCRETE)
OFFSET TO ONE SIDE WITH CURB & GUTTER

MOW STRIP SURFACE 1/2" ABOVE BACK OF CURB

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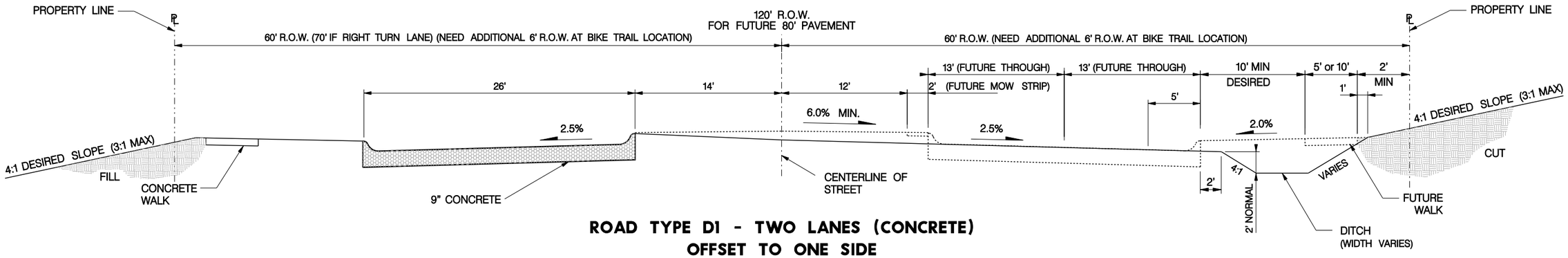
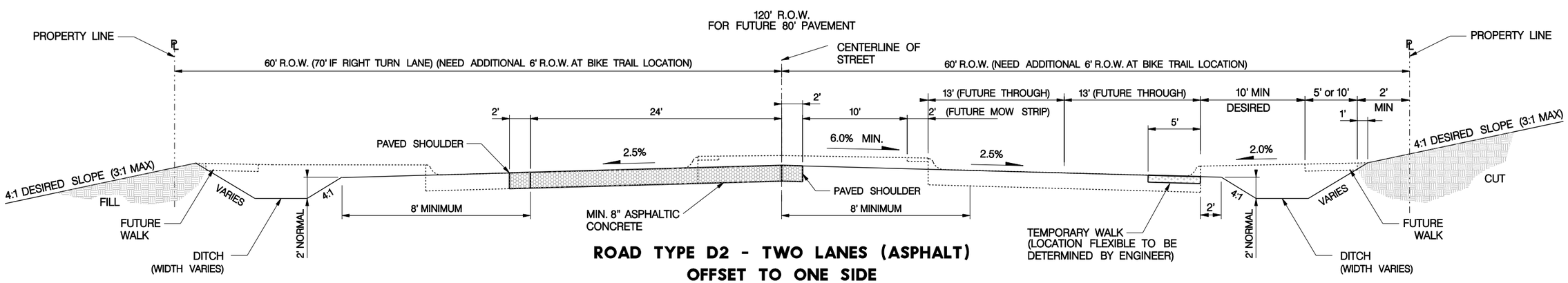


ROAD TYPE D1 - TWO LANES (CONCRETE)
OFFSET TO ONE SIDE

MOW STRIP SURFACE 1/2" ABOVE BACK OF CURB



ROAD TYPE D2 - TWO LANES (ASPHALT)
OFFSET TO ONE SIDE

MOW STRIP SURFACE 1/2" ABOVE BACK OF CURB

SHEET 3 OF 3
PAVEMENT SECTIONS