Design Characteristics and Resource Descriptions for Sandoval

Design characteristic criteria and resource descriptions, sources of data, and methodology of impact assessment is listed below.

Design Characteristics

Length of Roadway

The total length of each alternative was measured in miles.

Right-of-Way Required for Construction

Total right-of-way (ROW) acquisition was calculated for each alternative. The total includes area that is in existing ROW.

New Interchanges

The number of new interchanges proposed for each alternative was counted.

New Impervious Area

The new area of pavement required to construct each alternative was calculated. The area of pavement included the pavement required for the mainline roadway, collector distributor roadways, and all interchange ramps. All areas were calculated by measuring the length of each type of roadway and multiplying by its width. The widths for each type of roadway were determined from the IDOT BDE and included the inside and outside shoulders.

As the amount of impervious area increases, storm water quality may decrease, and the quantity may increase, which can have a negative effect on surrounding ecosystems. The total area of new pavement required was calculated to determine the amount of new impervious area that will be constructed for each alternative. This was determined by subtracting out the area of existing roadway pavement from the area of total pavement.

Estimated Cost

The estimate includes the cost of pavement, intersections, ROW, grade separations, interchanges, and drainage structures.

Social/Economic Criteria

Total Residences Displaced

Homes were identified within the alternative limits based on information from ESRI (Environmental System Research Institute, Inc.) data, Google Maps, and public feedback. Buildings were located by the project team using 2008 aerial photography and verified with field visits. The buildings identified as residences were compared to business and public facility buildings in order to remove duplicates.

A residence was considered impacted if any part of the building structure is located within the alternative limits. Only the residential structure was counted as being impacted; freestanding garages or other

structures on the respective property were not counted as impacted. Residential buildings under construction were counted. Farmsteads were included in the count of residential buildings.

Businesses Displaced

Commercial buildings were identified within the alternative limits based on information from ESRI (Environmental System Research Institute, Inc.) data, Google Maps, and public feedback. Buildings were located by the project team using 2008 aerial photography and verified with field visits. The buildings identified as businesses were compared to residences and public facility buildings in order to remove duplicates.

A commercial property was impacted if any part of the building structure is located within the alternative limits. Commercial impacts were computed as each commercial building impacted. Several commercial properties incorporated multiple buildings. Each building was counted as a separate commercial building. If a commercial property was located within a multi-use building along with residences, each was counted.

Agricultural Criteria

Farm Businesses Displaced

Farm businesses were identified within the alternative limits based on information from ESRI (Environmental System Research Institute, Inc.) data, Google Maps, and public feedback. Farm businesses were located by the project team using 2008 aerial photography and verified with field visits. The buildings identified as businesses were compared to residences, public facility, and non-agricultural businesses in order to remove duplicates.

A farm business property was impacted if any part of the building structure is located within the alternative limits. Commercial impacts were computed as each commercial building impacted. Several commercial properties incorporated multiple buildings. Each building was counted as a separate commercial building.

Agricultural Soils

Agricultural soil is land within the proposed right-of-way that is currently used or could potentially be used as agricultural land. These areas do not include land within the proposed project right-of-way that is paved, covered by water, or urban development.

The digital format Natural Resource Conservation Service (NRCS) soil maps for each county were used to measure agricultural soil impacts. In characterizing impacts to prime farmland, any agricultural land within the alternative footprint was measured and rounded to one acre.

Farm Severances

Severed farm operations occur when a new roadway divides a farm either laterally or diagonally, and separates one or more tract from others within a single farm operation. If an alternative takes farm land on the edge or perimeter of a farm tract, this is not a severance. Farm tracts were obtained from the U.S. Department of Agriculture.

In characterizing impacts to farm severances, if any portion of the alternative severs the parcel and the severance results in less than 25% of a parcel separated from the remainder of the parcel, it is counted as one impact. A severance was determined if a proposed alternative bisected a tract and resulted in two unconnected tracts. A severance was also determined if greater than 1/3 of the tract was taken by a proposed alternative.

Affected Farms

Farms affected are tracts that are either completely taken by a proposed alternative or less than a 1/3 of a tract was taken by a proposed alternative but the tract is not severed. Farms otherwise affected also included severed tracts where the resulting farmable area was less than 5 acres

Total Adverse Travel between Split Farm Parcels

Adverse travel occurs when a new roadway causes additional travel distance from one part of a farm operation to another part. Added travel is typically caused by severance of a farm operation by a new roadway or by a road closure, and is calculated as the one-way mileage per field visit. Adverse travel equals the old trip distance minus the new trip distance times two. This represents one round trip per year.

Prime Farmland

The Code of Federal Regulations (CFR) Title 7, Volume 6, Section 657.5(a) defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. Prime farmland does not have to be cleared; however, it cannot be urbanized, paved, or permanently under water.

The digital format Natural Resource Conservation Service (NRCS) soil maps for each county were used to measure potential prime farmland impacts. The digital soil maps identify each soil type designated as prime farmland. In characterizing impacts to prime farmland, any soil type designated as prime farmland within the alternative footprint was measured and rounded to one acre. Developed areas, including existing roadway under pavement, are not considered prime farmland and were subtracted from the total acreage.

Statewide and Local Important Farmland

Farmland of Statewide Importance is farmland other than Prime Farmland that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State agency. Important farmland includes prime farmland soils with steep slopes or eroded farmland

The digital format Natural Resource Conservation Service (NRCS) soil maps for each county were used to measure potential important farmland impacts. The digital soil maps identify each soil type designated as important farmland. In characterizing impacts to important farmland, any soil type designated as important farmland within the alternative footprint was measured and rounded to one acre. Developed areas, including existing roadway under pavement, are not considered important farmland and were subtracted from the total acreage.

Natural Resource Criteria

Forests

Forested areas were identified within the alternatives using an aerial map. In characterizing impacts to forested areas, any forested area within the footprint was measured and rounded to one half acre.

Protected Species

Protected species are threatened and endangered (T&E) species and all types of plants and animals which face possible extinction in the near future if steps aren't taken to protect them. These species are protected by both state and federal laws, such that avoidance of these resources is required to the maximum extent possible. T&E species were surveyed by the INHS during field visits.

Water Resources Criteria

Surface Water Crossing

Streams crossed by the alternatives were identified for purposes of providing a measure of water quality impacts. Each stream may have more than one crossing by the same alternative and each crossing is counted individually.

Private Water Well

Drinking water supplies represent groundwater and surface waters used as a supply of potable water. The main supply of drinking water for users within the cities of Normal and Bloomington limits is provided by Lake Bloomington, Evergreen Lake, and fifteen groundwater wells. Private wells provide potable water for residences located outside the Bloomington and Normal city limits. Sources of data used to identify drinking water supplies included Source Water Assessment Summary Fact Sheets from the IEPA website as well as the ISGS water well database.

In characterizing impacts to drinking water supplies private wells were identified within the ROW and within the setback zone to assess potential impacts. A setback zone is a geographic area containing a public or private well with restrictions on land uses within that zone to protect water supply—400 feet for public water supplies and 200 feet for private wells. Private wells within the ROW will be properly abandoned in accordance with state requirements.

Wells that can potentially be affected by a new roadway would be those within 200 feet of the roadway and are shallow, improperly cased, or directly hydraulically connected to highway runoff. For these wells there is the possibility of increased chlorides in the groundwater. Additionally, where shallow ground water aquifers exist, the direction and supply of groundwater must be maintained. The private wells within the ROW and 200-ft setback zone impacted were counted.

Floodplains

Floodplains are low-lying areas that often flood after storm events. The regulatory (100-year) floodplain is the portion of subject to floodplain laws, regulations, and ordinances. Executive Order 11988 (Protection of Floodplains) requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development when a practicable alternative exists. Floodplains within the alternatives have been identified by the Federal Emergency Management Agency (FEMA). Flood Insurance Rate Maps (FIRM) maps were obtained from FEMA for each county. Linear feet of floodplains crossed and total number of floodplains crossed were counted for each alternative.

Wetlands

The U.S. Army Corps of Engineers (USACE) (Federal Register 1982) and the U.S. Environmental Protection Agency (Federal Register 1980) jointly define wetlands as: “Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions”. Wetlands include forested areas, wet meadows, and a variety of habitats exhibiting the hydrology, soils, and vegetation required by the USACE.

Executive Order 11990 (Protection of Wetlands) requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of wetlands, and avoid direct and indirect impacts whenever there is a practicable alternative. Avoidance of wetlands was of first importance in evaluating alternatives. Minimizing wetland impacts was an important criterion in evaluating alternatives. In characterizing impacts to wetlands, any wetland area within the footprint was measured

Special Waste Sites

Special wastes are regulated by the Illinois Environmental Protection Agency (IEPA) and also include a variety of waste materials, such as potentially infectious medical waste, pollution control waste, or industrial process waste, or petroleum contaminated soils. Special waste must be managed and disposed of properly to protect human health and the environment. Special waste sites affect construction projects because of high clean-up costs and safety hazards through exposure and material handling.

The Illinois State Geological Survey (ISGS) completed a database search of special waste sites in the study area. In characterizing impacts to special waste, any special waste site that lies within the alternative footprint is counted as one impact.