Existing Conditions Memo

Supporting the 2023 updates to the Licking County Thoroughfare Plan and City of Newark Thoroughfare Plan

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1. Executive Summary and List of Strategic Needs

This document provides an assessment of transportation system existing conditions and needs throughout unincorporated Licking County and the City of Newark. The assessment is based on input from stakeholders, knowledge of local development trends and character, and a review of travel demand model (TDM) outputs and traffic crash datasets. Combined, these sources help to identify the following needs throughout Licking County and Newark.

The following are identified as strategic needs to be addressed through the creation of Thoroughfare Plans for the County and City. Corridors and areas are illustrated in Figure 1 on the following page.

- Management of congestion in Licking County, including the following key intercity travel corridors:
 - o US-62 between Franklin County to points northeast of Johnstown,
 - SR-16 between the Franklin County line and SR-37 (Granville),
 - One or more improved north-south routes in western Licking County, such as Mink Road or SR-310 between I-70 and Johnstown.
 - Improvement of SR-79 through Heath.
 - Improvement of Thornwood Drive corridor as an alternative.
- Congestion management and/or the provision of alternate routes to alleviate traffic in Newark on the following streets:
 - N 21st Street W Main Street to Deo Drive/Goose Pond Road
 - W Main from the hospital to SR-79
 - o 30th Street from Heath to Church Street
 - Mount Vernon Road (SR-13) from downtown north to Marion Road NE (SR-657).
- Identification of priority locations for safety countermeasures, particularly at hot spots where traffic volumes are higher and/or are expected to increase.
- Identification of strategic projects and financing methods to help contain the cost of infrastructure needed to accommodate future development. Identification of opportunities to plan development and transportation projects in tandem.



Figure 1 – Key Travel Corridor Needs (Exhibit 14)

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2. Stakeholder Interviews and Research

A number of stakeholders were engaged to gain their perspective on transportation in Licking County and Newark. Documentation of this process, including a list of participants, is provided in Appendix B. The following is an overview of the engagement process and activities:

- Identification of Stakeholders

Working with project team staff to assemble a list of stakeholders, both internal and external.

- Stakeholder Focus Group Meetings

Three focus group meetings were held. These include

- A staff focus group with staff from Newark, Licking County, and the Ohio Department of Transportation District 5.
- A City stakeholder focus group with City staff, health care, education, and development partners.
- A County stakeholder focus group with County staff, economic development, and other interested parties.

- Targeted Stakeholder Interviews

A series of interviews were conducted with local businesses, Licking County Transportation Improvement District, and others.

- Adjacent Jurisdiction Connectivity Coordination

Staff contacted adjacent communities including New Albany, Pataskala, Heath, and Hebron to request information about planned roads and annexations. Data was provided by Pataskala and Hebron. A meeting occurred with New Albany.

Key Findings

- At this time the Licking County Engineer's focus is maintenance of the existing County road network based on available funding. The Licking County Transportation Improvement District focuses on new road alignments and major improvement projects, typically funded through specific funding and/or financing agreements. In Newark, the City maintains as well as improves its roadway network. State and US highways outside of municipalities are maintained and improved by ODOT, primarily administered through District 5. Funding for road and street improvements is limited, particularly for the County.
- The announcement of Intel and its 3,000+ jobs is a continuation of recent economic growth in the County, where over 30,000 jobs have been added over

the past 10 years. Intel's jobs will pay more and have a larger economic impact, but Intel simply adds to the rapid pace of growth seen in other areas of the county, most notably Etna Township. The influx of funds to support Intel may present an opportunity to see some long-standing projects addressed sooner rather than later.

- Local stakeholders expect Intel to have a more local impact on growth than at least initially estimated by ODOT. A revision to the Mid-Ohio Regional Planning Commission (MORPC) model with Intel reportedly shows that initially about 85 percent of Intel's site traffic heads west to Franklin County and the rest split between those coming from the east, south, and north. Several stakeholders indicated that they expect more traffic to come from Licking County.
- Anecdotally, there is substantial interest in Complete Streets and promoting improved access and safety as the county and city street networks are improved. Moreover, there is interest in how transit and trails can connect with and promote a complete transportation network.
- There are upwards of a dozen or more planning efforts occurring throughout the County. Most notably, the Evans Foundation is working to plan a development framework plan to help identify where development may be preferred and how to preserve the area's distinct characters—rural, small town, and a seat of innovation.
- Stakeholders identified the following as key needs, with letter values matching those shown on Figure 2 on the following page:
 - A. North-South Improved Corridor connecting I-70, Pataskala, SR-161, and Johnstown. May or may not follow existing alignments.
 - B. Thornwood Drive corridor improvements between SR-79 and SR-16.
 - C. W Main Street corridor improvements near Thornwood Drive.
 - D. Possible new street connection between King Road and N 21st Street.
 - E. Reddington Road Improvements.
 - F. North and south 21st Street congestion and safety issues.
 - G. Brownsville Road safety issues (perception) near Licking River.
 - H. SR-16 at-grade signalized intersections (Marne, Brownsville) on what is otherwise a limited access highway without signals—congestion, safety.
 - I. Congestion issues on I-70 between SR-256 and SR-79.
 - J. Intermittent flooding along I-70 near Buckeye Lake.
 - K. Johnstown Bypass Mink Road to US-62.
 - L. Downtown Johnstown intersection improvements (US-62 and SR-37).
 - M. Buckeye Scenic Trail terminus at Hopewell Drive.
 - N. Interest in fixed-route transit at Licking Memorial Hospital.

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Figure 2 – Stakeholder Identified Needs

3. Existing Land Use and Transportation Plans, Code, and Development Trends

A. DEVELOPMENT CONTEXT

Licking County, Ohio covers nearly 700 square miles of area and its development context greatly varies across it. Three generalized development contexts are set in Figure 3 below. These include the *Western Townships* which have fairly flat to rolling terrain, and traditionally has been agricultural in use. Yet given the proximity of west-central and southwest Licking County to Columbus' eastern suburbs, changes in use from agricultural to residential, retail, and industrial have been a trend some 50-plus years in the making. *Central to South-Central Townships* include the conglomeration of Newark, Heath, Granville, and other communities. Completion of a continuous four-lane expressway to Columbus around 2010 has made these communities more attractive for commuter households and expanded business opportunities. The *Eastern and Northern Townships* vary in topography and



Figure 3 – Development Context Areas

development with areas east of SR-661 being relatively hilly, limiting most agricultural and residential uses to valley properties. West of SR-661, most townships are relatively flatter and are predominantly agricultural in use with some low-density residential homesteads.

Western Townships

Western Licking County (see Figure 4 below) has seen substantial conversion of agriculture and wood lots to into housing, commercial, and retail developments. Most of this activity has occurred within areas which are now incorporated New Albany, Reynoldsburg, and Pataskala; however, availability of utilities without annexation has led to substantial amount of growth in unincorporated Harrison Township over the past 30 to 40 years, and more recently substantial portions of Etna Township. Between Amazon and numerous other warehousers, Etna Township has seen more than 11,000 thousand jobs added over the past 10 years. New Albany's Beauty Park has added some 14,000 jobs and the Licking County Port Authority has created another 7,000 on the west side of Heath.

With the announcement of Intel's New Albany plant with 3,000 new iobs, residential, retail, and industrial developments are expected to increase substantially in Jersev and St. Albans townships along OH-161, and in southern Monroe Township on the outskirts of Johnstown. Plans for Southwest Licking County Sewer and Water District (LCSWD) to construct a wastewater treatment plant in Jersey Township may continue to contribute to growth in unincorporated areas-potentially where supportive transportation and other infrastructure lacks, and where the ability to finance such improvements is typically limited. Mechanisms to capture revenue such as JEDDs have been successful in Etna Township, capturing revenue to help pay for specific transportation improvement projects.



Figure 4 - Western Townships

Within the western townships—Jersey, Etna, Harrison, and southern Monroe and St Albans townships, there is a potential to develop private-public partnership developments—potentially those where transportation improvements can be contributed by developers potentially as part of rezoning and/or subdividing land. A prime example may include improving a section of arterial along a new alignment while allowing for retail and commercial land uses would benefit from the increased pass-by traffic and exposure. Such project can provide an opportunity to guide growth to occur with preferable aesthetics, forms, and contributions to the public good such as a new road alignment.

Without proactive leadership to help finance and direct where proposed travel corridors and intersection improvements should be located, piecemeal development and a patchwork of "*temporarily permanent*" improvements will become the norm, and dramatically pick up pace over the next year—as we get closer to the opening of Intel and as interest rate increases slow or even reverse course. As seen in area across the Ohio and the nation, the resulting sprawl reduces quality of life, travel conditions, and will likely strain public services and general revenue funds.

All townships and municipalities within Western Licking County have zoning. Further, new and changed access points are regulated in unincorporated areas. Access changes to county and township roads are regulated by the county's Access Management regulations as well as Section 500 of the Licking County Subdivision Regulations. The type of development that is proposed determines which set of regulations apply. Developers sometimes express a need for additional access points beyond what the regulations explicitly permit, particularly for warehousing and industrial land uses. This requires the developer to go through the variance process and variance is not guaranteed. Further, changes in access to state and US highways are regulated by the Ohio Department of Transportation.

Central to South-Central Townships

Central and southern Licking County (see on the following page)has also seen growth in the past 30 to 40 years; however, most of this growth has been within or adjacent to the communities of Newark, Heath, Granville, Hebron, Buckeye Lake, and Hanover. Growth in this area is expected to continue, particularly where municipalities with water and/or sewer services can provide necessary utilities to allow for redevelopment as a condition of annexation, or through other agreements.

For the City of Newark, there has been private interest in expanding development north and east of the city. Water and sewer are generally available to be expanded into these areas; however, some of these areas are particularly hilly. Area roads connecting developable tracts are rural in character, and lack the sidewalks or paths needed to connect new development to area schools and the rest of the City, its amenities and services. While these challenges can be overcome, doing so may be expensive. Newark officials eye the potential for redevelopment to be a source of growth—converting abandoned and underutilized parcels to residential uses and places of employment.

Over the next 20-30 years, some combination of both greenfield and redevelopment projects are likely. Given that the City controls water and sewer access, it is in a better position to encourage developments which are financially beneficial to the City, particularly with respect to the need to expand infrastructure-roads, utilities, emergency services, and more.

All townships and cities within the Central to South-Central Licking County area have zoning.

Like western Licking



Figure 5 - Central to South-Central Townships

County, new and changed access points in unincorporated areas are regulated. New and changed access points on county and township roads are regulated by the county's access management and subdivision regulation standards. Changes in access to state and US highways are similarly regulated by ODOT.

At present, the City of Newark does not have access management regulations but has some ability to influence access decisions through the zoning code which requires any development more intensive than single family residential to go to the Planning Commission for site plan approval. This results in a case-by-case review where the engineers state their access management desires to the Planning Commission and try to get the commission to make those items a condition of site plan approval. The City Engineer generally tries to follow the ODOT access management recommendations on major roads, and they also consider the county's access management standards. One challenge is that both the ODOT and the Licking County regulations are less applicable in an urban context.

Eastern and Northern Townships

Licking County's eastern and northern townships (see Figure 6 on the following page) are, with few exceptions, likely to remain rural in character and development intensity for the foreseeable future. These townships include Bowling Green, Franklin, Hopewell, Madison, Hanover, Perry, Mary Ann, Fallsbury, Eden, Newton, Washington, Burlington, McKean, Liberty, Bennington, and Hartford. The notable exceptions include areas along

key transportation routes such as I-70 and its interchanges within or near Bowling Green and Hopewell townships, and areas along OH-16 in Madison and Hanover townships.

Of the 16 townships within this area, all have township zoning except Hopewell, Hanover, Perry, Mary Ann, Fallsbury, and Eden townships.

Like the other areas, new and changed access points are regulated in unincorporated areas. The County's Access Management standards and Subdivision Regulations, Section 500, regulate access to county and township roads. ODOT's access management standards apply to access points on state and US highways. While the instruments are the same, geometric and operational issues are more common in northeast Licking County. These include substantial elevation changes, horizontal and/or vertical curves, and gravel roads—all of which can affect site distance. The stark differences between the flatter, western parts of the county verse the hilly eastern parts of the county make it difficult to apply uniform requirements.



Figure 6 - Eastern and Northern Townships

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B. ASSESSING THE IMPACT OF INTEL

In late winter of 2022, Intel and the State of Ohio announced that two semiconductor chip fabrication lines would be built at a new factory off Mink and Green Chapel roads on a parcel recently annexed from Jersey Township into the City of New Albany. The initial development will have 3,000 employees and the potential to generate up to 13 jobs per Intel job between suppliers and those providing goods and services to Intel's employees. All told, this may result in up to 42,000 jobs attributable to the first phase, and subsequent phases including additional fabrication lines may be built at the site as needed.

In terms of population and households, a rough estimate, assuming a mix of 25 percent single-person-single-job households without children, 25 percent two-person two-job households without children, and 50 percent two-adult and two-child households with 1.75 job households. Based on these assumptions, 42,000 jobs will support upwards of 51,000 residents—though most will likely not live in Licking County.

While additional growth in jobs and households was assumed in the 2050 model run of LCATS' Metropolitan Transportation Plan (MTP), the announcement of Intel will likely result in a substantial increase in the number of jobs and households in Licking County and its communities, particularly within the western half of the county. The following qualitative assessment is provided to estimate the impact of Intel with respect to this effort.

- Near-Term (2022-2025)

In the near term, most development spurred by Intel is expected to occur in areas already served by water and sewer utilities, and areas where development has been occurring—on the north, northeast, and east suburban fringe of Columbus and I-270, but also to some extent in comparably smaller communities in Licking County—Johnstown, Newark, Heath, Granville, Gahanna, Pataskala, and Reynoldsburg. During this period, utility providers will fast-track plans to expand service in western Licking County, most notably Southwest Licking Community Water and Sewer District's (SLCWSD) plan to construct a new wastewater treatment plant in Jersey Township. Yet, in spite of this investment, decisions about rezoning remain in the hands of trustees in Jersey Township. From a traffic perspective, increases in traffic volumes are expected to be highest near Intel and decline as one moves farther away from the site. The most significant projected increase is a section of Green Chapel Road, projected to increase from 160 vehicles per day to over 13,000!

- Mid-Term (2026-2035)

In the mid-term, new water and wastewater infrastructure will likely accelerate development in western Licking County, presumably much of it in

unincorporated areas as access to SLCWSD services will presumably not require users to annex into a municipality to access its utility. Over this same time, growth is expected to continue in area communities throughout Licking County. This will place additional pressure on key commuting routes, but access to and from Intel will comprise a minority of the additional traffic. Assuming 10 daily trip ends per household and one household member working at Intel, only two of those trip ends will travel to and from work.

- Long-Term (2036 on)

Long-term impacts will be very similar to those seen in the mid-term; however, as areas are built out, development pressures will move further out and turn to properties which were not as advantageous to develop before this point.

C. FUTURE GROWTH POTENTIAL

Development projects often require good access water, wastewater, and transportation infrastructure—in addition to electric, gas, and fiber. The farther a site is from this infrastructure, the more expensive it is for developers to extend it to make a site viable. As such, over the next five years development is likely to be concentrated in areas currently served by utilities and near transportation corridors with good access and less congestion. Exhibit 2 on the next page shows a generalized assessment of these areas based on proximity to existing utilities¹ (else jurisdictional boundaries for systems where water and sewer lines were not readily available) as well as key travel corridors, most of which have interchanges with I-70 or SR-161/36/16.

¹ Note this exhibit is based on limited water and sewer line network data. Where such data is not in our possession, we have substituted corporation limits as the basis for a 1-mile buffer. While distribution lines may be nearby, capacity to add users is also a factor. For more information, refer to Licking County's water and sewer masterplan project underway, led by American Structurepoint.



Access to Development-Supporting Infrastructure

Key Infrastructure (1-Mile Buffer)

Water and/or Wastewater Key Transportation Corridors

- Licking County Boundary
 - Township Boundaries
- Municipalities
 - Unincorporated Areas





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D. EXISTING CONTEXT TYPOLOGIES

Context is increasingly being recognized as a critical consideration for how we plan and design transportation corridors. Adjacent land use and density, development character, and overall proximity to areas of development tend to influence the types of trips people take, how far they travel, and whether they decide to walk or bike verse drive. A context classification system is a model which generalizes these relationships. The most well-known of these is the development transect model, shown below. This model shows the typical continuum of development from rural open space on left to bustling and dense downtowns on right.



Figure 7 – FDOT Context Classification Guide, Florida Department of Transportation, 2020.

Contexts generally predict travel behavior and preferences. Those who live in rural areas typically must travel some distance to complete trips, while those who live in more dense areas are often closer to where they wish to travel to. As such, those living in urban areas are more likely to complete those shorter trips on foot or by bike or bus. These kinds of generalizations can inform design decisions to ensure transportation corridors better support those who use them and better complement adjacent development. Outcomes include improved traffic safety, access, and designs which support community character and place.

While many jurisdictions use current development contexts to design transportation corridors, some jurisdictions are using their future land use and development plans to ensure tomorrow's investments support tomorrow's development contexts. Alternatively, some are designing streets to be retrofitted as contexts change. These are approaches which may be considered in crafting the thoroughfare plan.

Five context classifications have been identified for Licking County and Newark. These are presented on the following page. Examples of areas which typify these context classifications is provided in Figure 8 on page 18. Further, existing context areas were assigned for unincorporated Licking County and the City of Newark. This assignment, shown in Figure 9 on page 18 or in greater detail in Exhibit 3 (Appendix A) is based on predominant land use and character.

Existing Context Classifications

Rural Agriculture and Homestead

Today, these areas are predominantly low density, agricultural, rural homestead, or open space in use with a strong sense of rural character. These areas may include small residential subdivisions and other types of uses; however, such areas and uses are exceptions to the overall development context.

Suburban Residential

Suburban residential contexts are areas where low density (1 to 4 dwelling units per acre) developments are predominant. Area subdivisions may have sidewalks but often lack sufficient connections to adjacent developments and supportive neighborhood retail. These areas include both single family and multifamily residential development.

Suburban Commercial

Suburban commercial contexts are areas of predominantly regional retail and commercial activity—big box stores and strip centers with seas of parking. These areas may have sidewalks but the environment is often "auto-dominated" and lack sufficient connections to workforce housing.

Town Residential

Town residential contexts are typically higher density residential developments (5+ dwelling units per acre) designed with enhanced connectivity between adjacent developments and uses. Non-residential uses are likely present but the area remains predominantly residential in character.

Town Center

Town center contexts typically include a mix of land uses and a higher density, multi-story development with floor-area ratios between 0.5 and 1.5.













Figure 8 – Licking County and Newark existing context classifications and example locations.



Figure 9 – Existing Context Assignment

4. Traffic Forecasting and Capacity Analysis

To help assess traffic demand and capacity needs on area thoroughfares, travel demand model outputs from the 2050 Metropolitan Transportation Plan (MTP) were evaluated using a planning-level Quality Level of Service (QLOS) methodology. From here, some areas of congestion which may be over or under-estimated using QLOS methodology were further evaluated with intersection and/or corridor capacity analysis.

Given the number of exhibits, only select exhibits are shown on the following pages. All exhibits are provided in Appendix A. Exhibits have been prepared for Licking County and Newark and maintain the same numbering system; however, are presented in order—all for Licking County and then all for Newark in Appendix A, allowing one to easily compare findings between analysis years.

Exhibit	Description	Location
4	Illustration of existing travel lanes and present of divided medians or two-way-left-turn-lanes (TWLTLs). This shows the generalized existing conditions and assumptions used for the QLOS analysis.	Appendix
5, 6	Forecasted traffic volumes from the 2021 and 2050 travel demand model runs, respectively. These are the volumes used for the QLOS analysis.	Appendix
7	Calculated growth in volume between 2021 and 2050 (Exhibits 5 and 6). This exhibit shows the location and amount of traffic growth expected through 2050.	Page 21
8	Calculated annual growth rate of the growth of vehicular volumes between 2021 and 2050 volumes. This is growth in volume (Exhibit 7) divided by the volume in 2021 (Exhibit 5), divided by 29 years.	Page 22
9, 10	Quality Level of Service capacity analyses for 2021 and 2050 respectively. This analysis generally indicates where street widening—additional through lanes and/or a two-way-left-turn-lane is—is needed to meet planning-level corridor level of service criteria.	Pages 23 and 24

The QLOS methodology establishes Level of Service (LOS) thresholds for how much traffic can be conveyed along a corridor given the number of travel lanes, presence of a

median and/or turn lanes, and signalization characteristics in effectively rural, suburban, and urban contexts—and Highway Capacity Manual assumptions for each. At a planning level, QLOS can help identify potentially congested corridors and potential countermeasures such as widening and/or adding turn lanes. It does not assess intersection level of service, nor the impact of substantially congested intersections on a larger travel corridor.





Projected Growth in Daily Vehicular Volumes, 2021-2050

Output from MOPRC's 2050 Travel Demand Model

- Loss of 4,000 or more
- ----- Loss of 1,000 to 4,000
- ----- Loss of up to 1,000
- Gain of up to 1,000
- ----- Gain of 1,000 to 5,000
- Gain of 5,000 to 10,000
- Gain of 10,000 or more

Reference Layers

- Licking County Boundary
- Township Boundaries
- Municipalities
- Unincorporated Areas



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Vehicular Volume Annualized Growth Rate, 2021-2050

Output from MOPRC's 2050 Travel Demand Model

- Negative
 Up to 1%
 1% to 2%
 2% to 3%
 3% to 4%
 4% to 5%
- Over 5%

- Licking County Boundary
 - Township Boundaries
 - Municipalities
 - Unincorporated Areas







Quality Level of Service Analysis, 2021

Output from MOPRC's 2050 Travel Demand Model with **QLOS Analysis Method Applied**

- ----- LOS C or Better
- ---- LOS D
- ----- LOS E or Worse

- Licking County Boundary
 - Township Boundaries
- Municipalities
 - Unincorporated Areas







Quality Level of Service Analysis, 2050

Output from MOPRC's 2050 Travel Demand Model with QLOS Analysis Method Applied

- ----- LOS C or Better
- ----- LOS D
- ----- LOS E or Worse

Reference Layers

- Licking County Boundary
- Township Boundaries
 - Municipalities
 - Unincorporated Areas



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5. Crash Hot Spots

A crash hot-spot analysis was performed for crashes reported during the years of 2017 through 2021. A density analysis was performed for three sets of crashes—all crashes, crashes which resulted in at least one fatality or serious injury, and crashes where at least one party of the crash was a pedestrian or bicyclist. The density analyses report the number of crashes occurring within 2,000 feet, expressed as crashes per square mile. For simplicity's sake, the analysis was performed for all of Licking County, including non-participating jurisdictions.

All Crashes

Within the whole of the county (see Figure 10 below), the greatest concentrations of all crashes are located in Newark (see city-specific Exhibit 11N in Appendix A). High-density crash corridors and areas include N 21st Street between Moull Street and Deo Drive/Goose Pond Road and various streets in downtown Newark, with lesser



Figure 10 – Crash density heat map for all crashes in Licking County, 2017-2021

concentrations near the intersections of W Main Street and 30th Street, SR-16 and N Cedar Street, and N 21st Street between SR-16 and Granville Street. Within unincorporated Licking County there are some moderate to low-density hot spots including US-40 and SR-310, US-40 and Mink Street SW; intersections near the interchanges of I-70 with SR-310, SR-661/SR-37, and SR-79; and intersections near the interchanges of SR-16 (Columbus Road SW) with SR-37 and SR-16 with SR-37/SR-661 (Lancaster Road SW).

Fatal and Serious Injury Crashes

With respect to fatality and serious injury (FSI) crashes again most are concentrated in Newark. Shown below in Figure 11, the most substantial hot spots include various streets in downtown Newark, N 21st Street between Pierson Drive and Deo Drive/Goose Pond Road, with lesser concentrations near SR-16 and N Cedar Street, SR-79 and W Main Street, and N 21st Street between SR-16 and Granville Street. Throughout unincorporated Licking County, the most substantial hot spots are located in the vicinity of I-70 and SR-310, I-70 and SR-79, and Duncan Plains Road NW and Mink Street NW.



Figure 11 - Crash density heat map for fatal and serious injury crashes in Licking County, 2017-2021

Other areas with higher concentrations of FSI crashes include the intersections of US-40 with Summit Road SW, Pike Street (west), and York Road SW; SR-16 at Watkins Road SW; US-62 between Beach Road and Green Chapel Road; Tharp Road NW south of Morse Road; and SR-16 and Marne Road.

Pedestrian and/or Bicyclist Involved Crashes

As shown in Figure 12 below, the vast majority of pedestrian- and/or bicyclist-involved crashes are in Newark. More specifically, areas of high concentrations include downtown Newark and stretch north along the SR-13 corridor. Lesser concentrations of crashes are located near SR-16 and N Cedar Street (SR-79), and SR-79 and W Main Street. Lesser areas of concentration include N 21st Street between Pierson Drive and Deo Drive/Goose Pond Road, and W Main Street and 30th Street. Throughout unincorporated Licking County, pedestrian and/or bicyclist crashes are fairly scattered with no specific hot spots.



Figure 12 - Crash density heat map for pedestrian or bicyclist involved crashes in Licking County, 2017-2021

6. Consideration of Technology and Trends

A number of technological changes and trends are likely to affect development and transportation systems in Licking County and Newark over the next 20 to 30 years. These include the following:

Expanding Broadband Internet Access and Work from Home (WFH)

A growing share of office and professional services workers will be able to work from home at least part of the week. These workers are not commuting during typical AM and PM peak hours but are sometimes making more mid-day and PM-peak hour trips to run errands. Post-COVID, Work From Home is expected to remain a substantial factor affecting trip generation and purpose.

The "Amazon Effect" on Warehousing and Retail

A growing share of retail activity is occurring on the internet, typically via web-based applications on smartphones and computers. This new take on "shop from home" relies upon workers in warehousing and distribution to mail or deliver packages, rather than stocking local retail stores. Locally, this is reflected by the rapid increase in warehousing and distribution jobs and traffic. Retail stores remain competitive when customers want something now, or want to compare or experience a product before buying it—however they may need larger service territories to remain financially viable. As such, the share of retail amongst the overall land use mix is expected to decline, and be focused in destination retail environments. All combined, delivery trips are expected to increase and shopping trips are expected to decline.

Alternative Fuels and Electrification of Vehicles

While alternative fuels for vehicles are not new, the pace of adoption is picking up as the cost of electrification is declining. Over the past few decades, compressed natural gas and bio-diesel provided options for some fleet operators; however, limited points of distribution affected their widespread use. Electrification will eventually change this. Electricity is widely available; however, grid limitations and the slow adoption of charging infrastructure remain challenges. The cost of battery technology is declining, increasing vehicle range. Further, DC fast charging has the potential to increase the flexibility of when, where, and how long charging occurs. Assuming DC fast charging adoption picks up, some gas stations may transition to provide this service in addition to convenience retail and/or fast-food operations. Most electric vehicles require less maintenance, potentially affecting the number of automobile repair shops.

Connected and Autonomous Vehicles

Also on the horizon are connected and autonomous vehicles. Connected vehicles rely upon a person to drive the lead vehicle with other vehicles following it but not physically connected. This could allow a truck driver to lead a convoy of self-propelled vehicles between destinations, reducing costs to operators. From an intelligent transportation system (ITS) perspective, connected vehicles may require special signal equipment to hold a green phase until a convoy of vehicles has passed by. Given the potential need for

specialized equipment, this technology may be best suited for specific corridors used on a regular basis by specific operators who are willing to invest in the technology.

By contrast, autonomous vehicles are those where an on-board computer takes on some if not all aspects of driving. The Society of Automotive Engineers (SAE) has established a five-level system for classifying degrees of autonomous control (see below). Many vehicle manufacturers are incorporating some degree of this technology, but full adoption by most if not all is some ways off. Given the need for such vehicles to share the road with drivers and function on today's roads, few if any changes appear needed from an infrastructure perspective. Some speculate increased reaction times may allow autonomous vehicles to travel closer together, increasing the capacity of intersections and roads to convey traffic but the likely improvements are expected to be modest at best.

Intelligent Transportation Systems

Use of Intelligent Transportation System (ITS) technology has grown substantially over the past 20 years and this will likely continue. Such systems better manage changing traffic conditions through communication to motorists and adjusting means of traffic control. Examples vary from "Prepare to Stop When Flashing" and school zone flashers to messaging boards which communicate dynamic speed limits and traffic alerts to motorists. Some of the newest technologies include so-called Smart Signal Corridors. While signal corridors are routinely programmed to be coordinated based on preset programs, Smart Signal Corridors dynamically change signal cycle and phase lengths to respond to changes in traffic volumes as they occur.

Roundabouts and Alternative Intersections

The construction of alternative intersections has grown substantially across the nation, in particular new and retrofit roundabouts. Such intersections are designed to encourage motorists to travel at slow speeds, reducing crash severity, injuries, and fatalities. Roundabouts can greatly reduce intersection delay during non-peak hours, particularly when compared against signals.

Beyond roundabouts, a number of innovative at-grade intersections are growing in popularity—forestalling the possible need of a grade separated intersection or interchange. The most common of these include the Superstreet or J-turn intersection. Contrary to a typical signal, travel along a corridor is prioritized over side-road traffic. Where one approaching on a side-road may want to turn left or cross the Superstreet, all traffic turns to the right and those wishing to cross or turn left can perform a U-turn to complete their movements. While signals are still used, the number of phases can be reduced from 4 to 2, and travel along the corridor can be coordinated to progress efficiently.

Complete Streets, Vision Zero, and Speed Management

Most streets are used by a variety of users—those driving small cars, delivery vehicles, emergency vehicles, large trucks, and buses; those walking or biking, as well as those

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taking transit. Since the 1960s, most streets have been designed for and around their use by motorists. By contrast, the Complete Street approach focuses on designing streets around who is expected to use a street, and maximize the safety of all users, especially *Vulnerable Road Users (VRUs)* like pedestrians and bicyclists who are not protected within a metal vehicles. Further, the safety of our street networks has become an even higher priority within the past decade with *Vision Zero* programs, where agencies pledge to reduce the risk of injury or fatalities on our roadway networks. As such, agencies across the country are conducting Complete Streets and Vision Zero plans and adopting resolutions that aim to ensure our streets are safe for all who travel along them. Many such plans are now zeroing in on *Speed Management* as a top issue to address. Motorist speed can greatly affect the severity of a crash, or whether motorists can avoid one in the first place.

Shared Mobility and Mobility as a Service (MaaS)

Though predominantly seen in major metros, shared mobility and mobility as a service providers have tried their hand at launching services around the nation. To date, these services include:

- *Shared Vehicle Fleets* Cars, bikes, and scooters deployed throughout communities to make them easy for customers to find and rent by the hour or day. Some systems have designated parking spots or docks, while others allow users to park their vehicles at their destinations. These vehicles are owned by fleet operators such as Car2Go, Hertz, Lime, Uber, and many more, but notably are operated by the renter.
- *Expanded Livery and Delivery Services* Uber, Lyft, and other taxi services who provide rides, as well as others—Doordash, Instacart, and Amazon contractors who provide last mile delivery services of meals, groceries, and packages. These vehicles are operated by individual contractors working on behalf of the service provider.

As noted, most of these services are provided near exclusively in major metros like Columbus; however, some services may include portions of Licking County or Newark within their service territory. While the long-term viability of these services is in question as some providers have not yet become profitable, innovation in this sector is still continuing. For bike shares and potentially other services, some communities have contracted with firms to provide branded services. By example, the City of Columbus pays Motivate, a Lyft company, to provide a branded bike share service.

Shared and Monetized Parking Management

While charging for parking is not new, technology is being leveraged in new ways to manage parking. Traditional per-parking-space coin meters have been modernized in some communities to allow credit card payments per space, or to manage multiple spaces through kiosks which may accept cash, coin, and/or credit payments. More

recently, mobile-only payment has been adopted in a number of communities. Motorists use a smart phone and a credit card to pay for parking, either through a web browser or smartphone app. In some places, communities are ditching meters and kiosks all together and going with mobile-only systems—yet, such systems require use of a smart phone and a credit or debit card, potentially an equity issue.

Communities charge for parking for several reasons and its not just revenue. In traditional downtowns, an available on-street parking spot is often the most convenient for a short trip to a store or restaurant. Yet such spaces may be taken by those parking for the day if measures are not taken to discourage this behavior. For this reason, some systems operate at a loss just to ensure parking is available for local businesses and their customers.

While such approaches are typically taken to manage public parking on streets and Cityowned lots, some communities are encouraging private developers to adopt similar management to limit the amount of built for new developments. These include setting maximum parking ratios and discounting those based on time-of-day shared use, as well as potentially requiring monetization for spaces to help communicate the cost to motorists, even if those costs will be reimbursed. Such approaches help to encourage motorists to consider alternative modes of travel, and lower the overall cost of development and redevelopment projects

Appendix A – Exhibits

Licking County Exhibits 1-14	Pages 33 – 46
City of Newark Exhibits 1N-14N	Pages 47 – 62



Exhibit 1 **Stakeholder** Input

Identified Needs

- Point Linear
- Congestion \bigcirc
- Operational Improvements \bigcirc
- ♦ New System Link
- Flooding Issues \bigcirc
- → Transit \bigcirc
- ← Bike/Ped

- Licking County Boundary
 - **Township Boundaries**
- Municipalities
 - Unincorporated Areas





Access to Development-Supporting Infrastructure

Key Infrastructure (1-Mile Buffer)

Water and/or Wastewater Key Transportation Corridors

- Licking County Boundary
 - Township Boundaries
- Municipalities
 - Unincorporated Areas









Exhibit 3 Existing Context Classifications

Existing Context Class

- Rural Agricultural and Homestead
- Suburban Residential
- Suburban Commercial
- Town Residential
- Town Center

- Licking County Boundary
- Township Boundaries
- Other Communities
 - Unincorporated Areas



