

CERTIFIED COPY OF ORDER

STATE OF MISSOURI }
County of Boone } ea.

November Session of the October Adjourned

Term. 20 10

In the County Commission of said county, on the 4th day of November 20 10
the following, among other proceedings, were had, viz:

Now on this day the County Commission of the County of Boone does hereby **approve** the attached resolution for the Northeast Columbia Area Plan (NECAP).

Done this 4th day of November, 2010.

ATTEST:

Wendy S. Noren
Wendy S. Noren
Clerk of the County Commission

Kenneth M. Pearson
Kenneth M. Pearson
Presiding Commissioner

Karen M. Miller
Karen M. Miller
District I Commissioner

Skip Elkin
Skip Elkin
District II Commissioner

**Resolution to Adopt the Northeast Columbia Area Plan
(NECAP)**

Whereas, the Columbia Public School Board of Education selected a site for a new high school outside the municipal limits of Columbia on St. Charles Road; and

Whereas, the area in the vicinity of the selected site includes a mix of rural residential and agricultural land uses; and

Whereas, the governing bodies of Boone County and the city of Columbia believe that locating a high school in such an area will impact the growth and development of the area; and

Whereas, the Boone County Commission requested the Planning and Zoning Commission to engage the Columbia Planning and Zoning Commission in evaluating future land use for the area in the vicinity of the new high school site; and

Whereas the two Planning and Zoning Commissions endeavored to study an area roughly bounded by Interstate 70 highway on the south side, Mexico Gravel Road on the north side, Lake of the Woods Road on the west and one-half mile east of State Highway Z on the east; and

Whereas, the two Planning and Zoning Commissions conducted a number of open houses to solicit public input on the potential future development of the land within the study area; and

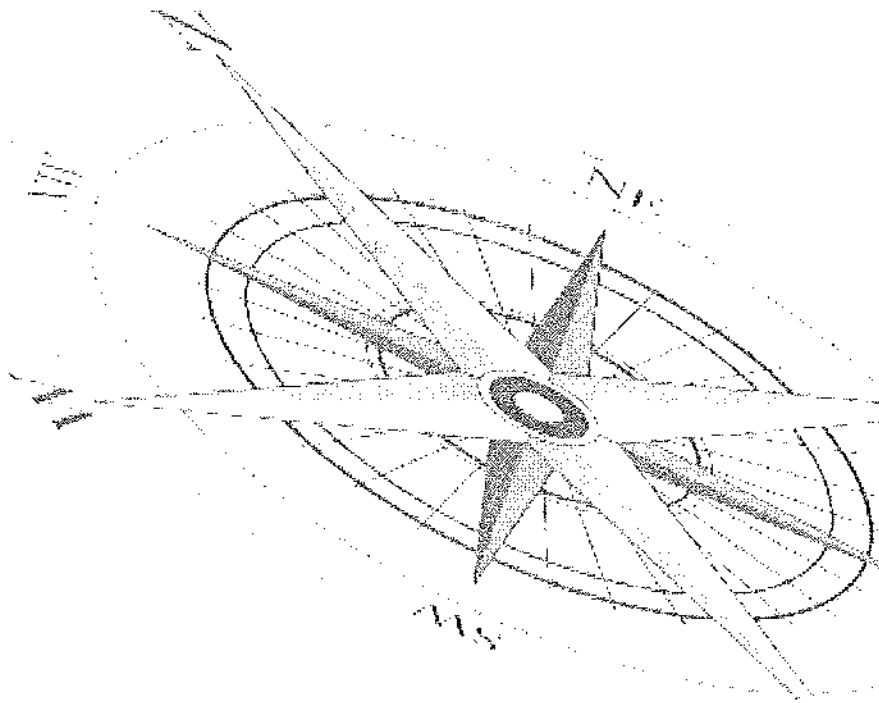
Whereas, the two Planning and Zoning Commissions incorporated public comment in an extensive future land use plan known as the Northeast Columbia Area Plan (NECAP); and

Whereas, the Boone County Planning and Zoning Commission recommended that the Northeast Area Columbia Area Plan (NECAP) be adopted as a sub-plan of the Boone County Master Plan at their October 15, 2009 regular meeting; and

Whereas, the Boone County Commission advertised and conducted a public hearing on the Northeast Columbia Area Plan (NECAP) during their March 2, 2010 meeting; therefore be it

Resolved, that the Northeast Columbia Area Plan (NECAP) is hereby adopted and considered to be a sub-plan of the Boone county Master Plan.

NORTHEAST COLUMBIA AREA PLAN



**A joint product of the
Boone County and City of Columbia
Planning and Zoning Commissions**

October 2009

020486
Filed in Clerk's Office
Permanent Record

Introduced by Hindman
First Reading 11-16-09 Second Reading 12-7-09
Ordinance No. 020486 Council Bill No. B 338-09

AN ORDINANCE

adopting the Northeast Columbia Area Plan, a supplement to the Metro 2020 Plan; and fixing the time when this ordinance shall become effective.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The City Council adopts the Northeast Columbia Area Plan, dated October 2009, a copy of which is on file in the office of the City Clerk.

SECTION 2. The Northeast Columbia Area Plan shall be used as a supplement to the Metro 2020 Plan.

SECTION 3. This ordinance shall be in full force and effect from and after its passage.

PASSED this 7th day of December, 2009.

ATTEST:

[Signature]
City Clerk

[Signature]
Mayor and Presiding Officer

APPROVED AS TO FORM:

[Signature]
City Counselor

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Northeast Area Plan

INTRODUCTION

1. Plan area description and current conditions

Containing roughly 3,104 acres, the Northeast Area Plan is defined as the area bound by I-70 to the south, Route Z to the east, Mexico Gravel Road to the north, and Lake of the Woods Road to the west. The land uses of the plan area are predominately agriculture with a handful of small neighborhoods and scattered housing on large lots. Exceptions to this pattern can be found along Lake of the Woods Road, where a fully developed neighborhood is contiguous with the outer reaches of the City of Columbia, and three small pockets of industrial and commercial zoning along the I-70 corridor. Of these pockets, two

consist of industrial zones containing ABC Labs and Fabick Heavy Equipment, and the third is a commercially zoned parcel that is currently vacant open land.

Several utility providers currently serve the plan area: Ameren UE (gas), Boone Electric Cooperative (electric), Boone County Regional Sewer District (sanitary sewer), and Water District #9 (water). While such services are available, expansion and/or upgrades to them will be necessary to permit greater levels of



development intensity. The city has plans to extend a sewer trunk line along the north fork of Grindstone Creek to provide service to the proposed high school site and undeveloped acreage east of Route Z. Such provision will provide opportunities to reach presently underserved areas. Boone County Electric has recently upgraded capacity on their utility poles along St. Charles Road and Mexico Gravel Road in anticipation of future need. Water capacity will need to be improved, as current water flows are limited and may not provide the new high school or commercial development with adequate fire flows. Select major roadways are in place but are not designed to accommodate the higher traffic volumes that will come with increased development. Two areas specifically identified by the Joint Commission as troublesome and in need of significant upgrades are the St. Charles Road corridor and the Route Z overpass.

2. What is the purpose of the sub-area plan?

MISSION STATEMENT

As directed by their respective governing bodies, the Columbia & Boone County Planning & Zoning Commissions will work jointly, bringing together various stakeholders and the general public, in creating a sub-area plan for the land surrounding the Columbia Public Schools' newest high school site.

This Sub-area plan will incorporate land-use objectives, identification of infrastructure needs, and recommendations for guiding growth as development in this area accelerates.

The need for this sub-area plan arose after the new high school site was chosen along St. Charles Road. It then became clear to both the Boone County Commission and Columbia City Council that a plan was needed to guide development that would accompany the high school. Both the Boone County and City of Columbia's visioning documents highlight the need for greater cooperation among the governing bodies to strengthen and legitimize each other's policies. This sub-area plan is the result of such cooperation and is intended to serve as a guide for further coordination in the future.

The purpose of the Northeast Area Plan is to portray how the planning area relates to its larger setting in terms of land use, public facilities, transportation, open spaces and natural environment, and infrastructure. As developments are designed, proposed, and expand into the area, this plan is intended to offer predictable outcomes for both developers and residents alike.

It is not the intent of the plan to have one principle take precedence over another. Each principle is equally important and contributes to the strength of the entire document. When evaluating a particular proposal, decision makers should recognize that determining the merits of a proposal will often not be a black-and-white issue. Decision makers must determine which principles and underlying policies are most relevant to a given proposal. In many cases, certain proposals will comply with some principles, may be unrelated to others, or may even appear to be in conflict. In such cases, it is incumbent upon the respective City or County Planning staffs to provide a detailed analysis and recommendation concerning the applicability of each principle and its underlying policies to decision makers.

This plan is not a regulatory tool, nor is it absolute. It is a document that should be used to develop and implement new policy for both Boone County and the City of Columbia. The plan proposes strategies for future land-use patterns, efficient traffic movement, protection of the natural environment, and coordination of infrastructure. The plan will have no effect until new policy is developed through established public processes and passed by the Boone County Commission or Columbia City Council. The proposed strategies attempt to make clear the public's desire for the future of the plan area. It is essential, therefore, for Boone County and Columbia citizens to remain involved in the ongoing process of the plan's implementation.

The Northeast Area Plan should be viewed as a living document. It is vital that the plan be periodically reviewed and updated. Moreover, measurable outcomes or benchmarks should be developed to gauge the community's progress on implementing the plan's goals, objectives, and strategies. A regular process of analysis and revision must occur to ensure that the goals, objectives, and strategies remain valid. The plan should be reviewed, and amended if necessary, on a cycle of every five years at minimum.

3. What process was followed?

In fulfilling its charge, the Joint Commission engaged the public in a series of stakeholder meetings in mid-2008. Each meeting was open to the public and was attended by interested community members surrounding the new high school site. The information obtained during these meetings has been incorporated into the following document and served as the base from which the plan's goals, objectives and strategies took shape.

In addition to community residents, the Joint Commission sought out information from other sources as well. Information from utility providers and fire district representatives was sought to understand service limitations within the plan area. A report on safety and capacity issues relating to St. Charles Road prepared by the Missouri Department of Transportation, University of Missouri, and the Columbia Public Schools was evaluated to gain a better understanding of future transportation issues. The CASTO 2030 Plan was evaluated to identify planned and future roadway corridors that could be incorporated into the plan area's future growth in efforts to create a linked network of roadways that would provide for orderly movement of traffic in the future. The contents of the City's Final Vision Report, Imaging Columbia's Future and Best Management Plans for storm water control and stream buffer protection were reviewed to identify where common goals, objectives, and strategies of plan area residents and other planning or regulatory documents overlapped. And lastly, the Joint Commission obtained information from city and county staff on plan types, plan preparation strategies, and other technical information related to completing the plan for the study area.

After obtaining stakeholder comments and evaluating the various planning documents, the Joint Commission began the task of preparing the first draft of the area plan. The draft was completed in late 2008 after several joint work sessions and represented the collective ideas for guiding future growth in the study area. Beginning in early 2009, with staff assistance, the draft was refined to address technical issues and graphics were developed to supplement the plan's proposed text.

The final draft plan was completed in August 2009 and endorsed by the Joint Commission. A final stakeholder meeting will be held in September 2009 to present the plan's recommendations to interested parties. A joint public hearing of the City and County Planning and Zoning Commissions will be held prior to forwarding a recommendation to the City Council and Boone County Commissioners regarding final action on the plan.

4. Goals and Objectives derived from the process

- **GOAL:** Develop residential areas that promote a high quality of life for all residents of the plan area.
 - **Objective:** Expand the residential core of the plan area while maintaining the rural character of the existing land use pattern.
 - **Objective:** Incorporate green infrastructure into all new residential developments.
 - **Objective:** Adopt policies that create opportunities for socio-economically diverse mixed-use neighborhoods.
- **GOAL:** Develop integrated, appropriate commercial centers that contribute to the quality of life within the plan area.
 - **Objective:** Promote regional commercial centers along the Route Z corridor.
 - **Objective:** Promote limited commercial development within residential areas that supports neighborhoods and provides a buffer between more intense land uses and roadways.

- **GOAL:** Create opportunities to attract employment centers at the gateway to Boone County and the City of Columbia.
 - *Objective:* Develop appropriate and attractive employment centers between the extension of Clark Lane and I-70.
 - *Objective:* Consolidate employment centers to optimize existing and planned infrastructure.
- **GOAL:** Create school campuses that are integrated into the land use pattern.
 - *Objective:* Develop the new high school in a way that addresses the concerns of adjacent landowners.
 - *Objective:* Integrate any future elementary schools within residential neighborhoods.
 - *Objective:* Improve coordination between the City, County, and CPS.
- **GOAL:** Expand motorized and non-motorized transportation networks in an orderly, safe, and systematic manner based on existing plans and future demands.
 - *Objective:* Circulate automobile traffic in a safe and orderly manner that is integrated with the land use pattern of the plan area.
 - *Objective:* Incorporate accessible non-motorized networks of trails and sidewalks into all new land developments and roadways.
- **GOAL:** Develop the plan area in a manner that protects the natural environment and existing land use patterns.
 - *Objective:* Mitigate the impact that new development will have on the natural environment of the plan area.
 - *Objective:* Incorporate expanded open spaces in all new developments in order to mitigate their impact on the existing land use patterns and create buffers between dissimilar land uses.
- **GOAL:** Adequately serve existing and new developments with appropriate infrastructure in a timely manner.
 - *Objective:* Develop objective criteria that requires proposed developments be served by existing or planned infrastructure to promote orderly growth and reduce undesired development sprawl.

LAND USE

Residential

Maintaining rural character was a predominant theme in comments received from the current residents of the plan area. This task will not be easily accomplished with the addition of a new high school and the associated development that will come with it. To support the new high school, additional infrastructure improvements will be made, increasing the likelihood that the rural character that defines the area today will be lost. The following goals, objectives, and strategies are intended to help mitigate the effects that increased residential development and infrastructure expansion will have on the rural character of the plan area and assist in creating a high quality of life for all residents.

With the installation of new or upgraded infrastructure, residential neighborhoods are expected to expand from their current locations toward the interior of the plan area. Such expansion should occur within "urban villages" that are integrated within the larger rural context and buffered from more intense uses along the perimeter of the plan area.

Increased development intensity will be dependent on a site's ability to be served with public infrastructure. The majority of the plan area lies within Boone County's subdivision jurisdiction. According to the County subdivision regulations the ability to subdivide tracts into parcels less than 10 acres in size without public sewer or water is severely limited. While these limitations exist, they do not preclude a property owner from subdividing larger tracts of land in advance of available infrastructure. Such subdivision, while not preferred by the Joint Commission due to the perceived loss of rural character, will not immediately increase density. However, such action may result in greater difficulties when those tracts are further subdivided since existing improvements would need to be avoided. Additionally, such actions may limit the ultimate development densities envisioned by the Joint Commission in the plan area.

The plan area's current residents expressed their desire to preserve open space and incorporate green infrastructure into these new developments. Green infrastructure envisioned by these residents included, but was not limited to, non-motorized transportation alternatives, parks, preserved open spaces, and protected environmentally sensitive areas. Incorporating such green initiatives into new development is possible through creating expanded open spaces by either clustering housing or promoting large-estate lot developments. These expanded open spaces would contribute to the green infrastructure of the plan area by preserving and protecting streams, areas prone to flooding, tree-covered areas, and other sensitive natural topography. Preserving open space will be a key concept if any semblance of the current rural environment is to be maintained.

To support the desired "urban village" concept of development, new neighborhoods will need to incorporate limited multi-family housing as an available housing type. While multi-family housing is an essential part of the housing mix, the development of extensive R-2, R-3, R-4, or equivalent PUD multi-family housing projects will greatly detract from the rural character and quality of life for plan area residents. Efforts to incorporate multi-family housing that is smaller in character (such as townhouses or condominiums) and distributed throughout single-family neighborhoods will reduce the need for large-scale projects and create socioeconomically mixed environments. Integrated multi-family housing should be designed appropriately so as to not detract from the character of a single-family neighborhood.

To limit incompatibility, it is recommended that multi-family housing be owner-occupied when integrated within single-family neighborhoods. Successful implementation of this strategy will require developers to establish covenants or restrictions that legally promote this type of ownership. The use of this strategy will alleviate some concerns about integration while still offering affordable housing options for the community. Any integrated multi-family housing should be designed appropriately so as to not detract from the character of a single-family neighborhood. In contrast, rental multi-family developments should be allowed in the designated mixed moderate residential and neighborhood commercial area on the future land use map (see appendix).

Integrating housing within new developments will be a key to maintaining the plan area's rural character. However, as new development is introduced, it will also create the need for new services. Of greatest concern is ensuring that all new development is appropriately served by all elements of

infrastructure, including roads, in a timely manner. Consideration must also be given to strategies that will address the integration of small commercial nodes within or adjacent to residential areas, incorporating schools into residential areas, and the relation between residential areas and adjacent dissimilar uses. Developing strategies to address the integration of these new service demands will not only help to maintain rural character but will also protect the environment, reduce dependency on the automobile, and create a better quality of life for all residents.

- **GOAL:** Develop residential areas that promote a high quality of life for all people living in the plan area.
- **Objective:** Expand the residential core of the plan area while maintaining the rural character of the existing land use pattern.
 - **Strategy:** Establish reduced setbacks to allow for compact or clustered development while maintaining open space requirements.
 - **Strategy:** Develop incentives (e.g., density bonuses) that encourage compact or cluster development.
 - **Strategy:** When residential developers do not desire compact or clustered housing, encourage the development of large estate lots as an alternative.
 - **Strategy:** Develop minimum open space requirements for new residential developments that encourage more efficient land use.
 - **Strategy:** Revise conventional and planned zoning classifications to incorporate the above strategies.
- **Objective:** Incorporate green infrastructure into all new residential developments.
 - **Strategy:** Position open spaces to protect and preserve streams, areas prone to flooding, tree covered areas, and other sensitive topography.
 - **Strategy:** Integrate parks and trail networks within open spaces.
 - **Strategy:** Incorporate trail and sidewalk networks that provide non-motorized transportation within all new residential developments, and connectivity to adjacent developments, roadways, and the citywide trail network.
 - **Strategy:** Adopt comprehensive design standards for trail and sidewalk networks in all developments.
 - **Strategy:** Revise conventional and planned zoning classifications to require the inclusion of green infrastructure elements in all new residential developments.
- **Objective:** Adopt policies that create opportunities for socio-economically diverse mixed-use neighborhoods.
 - **Strategy:** Create land use incentives (ex. density bonuses) that encourage the integration of appropriate multi-family and mixed-use developments within single-family residential areas.

- **Strategy:** Establish guidelines for appropriate multi-family and mixed-use development within single-family residential areas that support and enhance the quality of life for all residents.
- **Strategy:** Any parking needed to support multi-family housing and mixed-use areas should be internally located so it is not the visual focus of the development.
- **Strategy:** Revise conventional and planned zoning classifications to allow for the integration of single-family, duplex/townhouse, multi-family residential, and mixed-use development.

Commercial

As infrastructure expands into the plan area and new residential development occurs, the demand for new commercial businesses will increase. While this trend is inevitable, some residents of the plan area do not desire commercial development of any kind. In recognition of this expressed desire, the following goals, objectives, and strategies are an attempt to mitigate the perceived negative impacts of commercial development on the plan area. These goals, objectives, and strategies have been developed in an effort to preserve the quality of life currently enjoyed by these residents while recognizing the fact that the plan area will eventually need some level of commercial development to support its increased population.

To preserve the rural character of the plan area, special consideration was given to where new commercial development would be appropriate. Several factors, such as infrastructure availability, accessibility, and future roadway improvements, were evaluated. Based on these considerations, new commercial development should be directed toward three locations within the plan area. Each area is intended to serve a specific purpose and function as the needs of the plan area expand and would have their own characteristics and limitations that are appropriate for each.

The first area envisioned for commercial development would generally be concentrated along the Route Z corridor, with more intense usage to be located near the interchange of Route Z and I-70. In this location, large-scale regional commercial development would be appropriate due to its proximity to this major transportation hub. This commercial corridor would be the only location where these types of intensive commercial developments would be allowed to occur in the plan area.

The Route Z corridor will be a major arterial roadway in the future. It is accessed by the I-70 interchange and will serve as the primary corridor linking Centralia to Columbia and beyond. For these reasons, Route Z lends itself to development with relatively intensive commercial uses on large parcels of land that draw in traffic from around the region.

To ensure that the impacts resulting from this increased development intensity do not adversely affect the remaining plan area, it will be necessary to identify and develop specific strategies for maintaining this area's appeal for quality development. Consideration should be given to the intended purpose of Route Z as well as the need to maintain large contiguous development parcels.

Access to the Route Z corridor should be limited in order to maintain its classification as a major arterial. Accesses should be consolidated into shared access points that would serve several parcels versus a single parcel. With such a strategy, traffic movements would be more predictable to end users, and the flow of traffic on the corridor would be improved. Regional traffic, drawn from outside the plan area by these new commercial centers, should be directed to the surrounding major corridors such as I-70, Route Z, and the extended Clark Lane, not the local roadway network.

In order to maintain large contiguous tracts for future development, several large parcels along the Route Z corridor should remain unsubdivided. These parcels are located strategically in areas that provide maximum visibility and accessibility. Strategies should be identified that would preserve these parcels in order to allow for coordinated master plan development.

The second area envisioned for commercial development would generally be located south of existing St. Charles Road and north of the future extension of Clark Lane. Commercial uses envisioned within this corridor should follow the "Neighborhood Commons" concept as described in the Metro 2020 Plan (see appendix) in order to support the residential neighborhoods of the plan area. While development and uses

within this corridor may be similar to that of Route Z, the intensity of development would be significantly less. Development within this corridor would be non-regional in scale and may include commercial and office/professional uses. To further integrate these districts it is recommended that the uses within such district be “mixed” as described in the “Neighborhood Commons” concept of the Metro 2020 Plan.

In contrast to the Route Z and extended Clark Lane corridors, the third commercial area envisioned for development would generally be within residential districts located in the interior of the plan area. These areas would be characterized by even less intensive development that is smaller in scale and intended to provide services for the residential neighborhoods of the plan area. These areas would also act as a buffer between more intensive uses and roadways. These districts would typically be located in close proximity to residential neighborhoods at intersections of major roadways and would provide ancillary goods and services for neighborhood residents. The establishment of these districts would play an important role in reducing the reliance on the automobile for everyday household needs and are an integral component of the “urban village” concept envisioned for new neighborhood development. To ensure compatible integration of these districts into the rural context of the plan area, special consideration should be given to these developments in terms of scale, open space, buffering, and allowed uses.

- **GOAL:** Develop integrated, appropriate commercial centers that contribute to the quality of life within the plan area.
- **Objective:** Promote regional commercial centers along the Route Z corridor.
 - **Strategy:** Support large-scale commercial development where adequate infrastructure exists along the Route Z corridor. This class of development will only be allowed along Route Z, South of St. Charles Road.
 - **Strategy:** Prohibit the development of large-scale commercial centers within the interior of the plan area that would draw in outside traffic.
 - **Strategy:** Program the plan area’s roadways with the objective of keeping traffic generated from this regional commercial district along major corridors such as I-70, Route Z, and the extended Clark Lane.
 - **Strategy:** Limit access to Route Z by utilizing shared access design with any commercial development plans being proposed.
 - **Strategy:** Identify potential opportunities that would encourage owners of large tracts along Route Z to limit the subdivision of their parcels.
 - **Strategy:** Encourage master planning for large tracts of land.
- **Objective:** Promote limited commercial development within residential areas that supports neighborhoods and provides a buffer between more intense land uses and roadways.
 - **Strategy:** Support limited commercial development between the existing St. Charles Road and the Clark Lane extension.
 - **Strategy:** Limited commercial nodes will be located along the edges of residential developments at the intersection of major roadways.
 - **Strategy:** Commercial developments in this locale will follow the “Neighborhood Marketplace” concept of the City of Columbia’s Metro 2020 Plan.

- **Strategy:** Any parking needed to support “Neighborhood Marketplace” areas should be internally located so it is not the visual focus of the development.
- **Strategy:** Incorporate available natural features and topography into landscaping and open space buffers.
- **Strategy:** Revise conventional and planned zoning classifications to include performance standards that address the above strategies for neighborhood commercial districts.

Employment Centers

Accessible and functional employment centers within the plan area are vital uses that will assist in sustaining increased residential and commercial development activities. The Joint Commission chose to classify light manufacturing, research centers, data/call centers, and any other developments that employ a large number of people under the general term “Employment Center”. Employment centers are not intended to be heavy industrial sites or parking lots for equipment that employ a small number of people. Employees working within these centers would be drawn from within and outside the plan area boundaries. As with commercial development, there are some residents that do not desire employment development of any kind. In recognition of this expressed desire, the following goals, objectives, and strategies are an attempt to mitigate the perceived negative impacts of employment development on the plan area.

In evaluating how such centers could be integrated into the rural context of the plan area, the Joint Commission considered several factors, such as the types of facilities desired, accessibility to existing or planned infrastructure, land area needed, and design characteristics. These factors should serve as the basis for evaluating all employment center proposals.

A key factor considered in integrating employment centers into the rural context of the plan area dealt with the types of facilities desired. While such centers can be sprawling facilities on single unplanned tracts of land, the Joint Commission prefers campus-style developments generally concentrated along the I-70 corridor between I-70 and the future extension of Clark Lane. This style of development is in direct contrast to the piecemeal development that currently dominates this corridor throughout Boone County. The large undeveloped parcels within this area present a ripe opportunity for coordinated employment development at a gateway to Boone County that is near the City of Columbia’s labor force.

As a stakeholder in promoting countywide economic growth, Regional Economic Development Inc. (REDI) has requested that employment center sites be made ready with appropriate infrastructure and zoning to attract a wide range of potential users. From a zoning perspective, much of the area identified for future employment center growth is already zoned for industrial use or can be petitioned for a land-use change. With respect to infrastructure availability, the area identified for future growth is presently insufficiently served to make the area attractive. Upgrading the Route Z overpass and extending sewer, electrical, water, and data services into the area will be critical in order for the area to develop to its fullest potential. However, the funding required for these infrastructure improvements may prove to be an impediment. The use of tax incremental financing (TIF), a community improvement district (CID), a transportation development district (TDD), and/or other funding mechanisms should be recognized as means to fulfill this goal. Ensuring that any proposed employment site does not degrade adjacent residential, commercial, or other employment developments in the plan area is another key element when integrating these sites into the rural context. To ensure that these centers are harmonious with the plan area’s land-use pattern, design standards using relevant performance measures should be applied. Expanded open spaces, buffers, and landscaping will be a key component of mitigating the perceived negative impacts of such development. Special attention should be also be given to parking lot development within new employment centers, as parking lots tend to dominate a development site. An option for addressing this necessary but land consumptive use would be to consolidate required parking into parking garages. While parking garages may not be realistic, shared parking and two-story stacked

lots that work with the topography of the land could be a realistic alternative that contributes to the expansion of green space.

- **GOAL:** Create opportunities to attract employment centers at the gateway to Boone County and the City of Columbia.
- **Objective:** Develop appropriate and attractive employment centers between the extension of Clark Lane and I-70.
 - **Strategy:** Prohibit piecemeal development of parcels along the I-70 corridor south of the future extension of Clark Lane.
 - **Strategy:** Identify potential opportunities that would encourage owners of large tracts along I-70 to limit the subdivision of their parcels.
 - **Strategy:** Encourage master planning for large tracts of land.
 - **Strategy:** Develop standards that would require attractive campus style employment centers containing expanded open spaces and landscaping.
 - **Strategy:** Abandon the ABC Lane configuration, as it exists in favor of the alignment depicted on the 2030 CATSO map and the Improve I-70 SEIS.
 - **Strategy:** Apply appropriate and objective performance measures that address the effects of proposed employment developments on the surrounding parcels.
 - **Strategy:** Where feasible promote two story stacked parking and/ shared parking between employment centers to increase green space.
 - **Strategy:** Revise conventional and planned zoning classifications to include performance standards that address the above strategies.
 - **Strategy:** Utilize grants or other financial incentives to extend infrastructure and prepare these sites in advance.
 - **Strategy:** Work with REDI to develop marketing strategies for subject properties.
- **Objective:** Consolidate employment centers to optimize existing and planned infrastructure.
 - **Strategy:** Concentrate the development of employment centers in the plan area along the extension of Clark Lane between I-70.
 - **Strategy:** Apply a sufficiency-of-services test using objective criteria to assess the appropriateness of a proposed employment center's impact on available or planned infrastructure when making land use changes.
 - **Strategy:** Insure that appropriate infrastructure funding is available for this area through the city and county's CIP budgeting process and other funding sources.

Schools and Public Facilities

The impetus for preparing the Northeast Area Plan was the announcement of a new high school site along St. Charles Road. While this event was the driving force for preparing the plan, there will be other public facilities needs impacting the plan area in the future as growth occurs. These public facilities will likely be additional school sites; however, they may also include parks and public safety facilities. Although school and public facility location decisions do not usually fall under the duties of either the City or County's Planning & Zoning Commissions, the Joint Commission felt that it was an appropriate subject for this particular plan area. The goals, objectives, and strategies below provide guidance for the development of the new high school site specifically and propose a framework for future school and public facility site selection and development.

During stakeholder meetings, the majority of public comments concerned the effect the new high school will have on existing neighborhoods and the increase in traffic on unimproved rural roads. While these comments were focused on a pending and tangible project, they are not unique and will likely be raised again should another school site be proposed within the plan area. Special consideration and coordinated planning efforts between the Columbia Public Schools (CPS) and City or County Planning and Zoning Commissions are necessary to ensure that the issues raised are not overlooked or their significance dismissed. Past coordination between CPS and both the City and County has been minimal at best. The Joint Commission believes a more proactive approach would significantly benefit the community as a whole.

More specifically focusing on the new high school site's development and stakeholder comments, the Joint Commission believes that certain issues should be considered as the project progresses. The new high school site is located in a largely rural area, but there are single-family residents on properties adjacent to the east and rental duplex housing to the south across St. Charles Road. As such, the new high school's site design should give special consideration to these existing and any future neighbors. Issues such as noise, stormwater, and light pollution are of particular concern. While CPS is required to comply with applicable local regulations dealing with these issues, it is desired that they not only meet but exceed the minimum standards. One option for effectively mitigating the concerns and issues would be integrating a public park into the site design as a buffer between adjacent residential areas.

By far, the majority of the comments and concerns with the new high school site dealt with the effect it would have on traffic in the plan area. Considering that 90% of high school students commute, and only 10% are within walking distance, the overriding effect of the new high school will be a significantly increased volume of traffic on rural unimproved roadways. Peak traffic times will be inevitable in the mornings and afternoons, as students commute to school, but unnecessary school-related traffic throughout the day also presents concerns and should be avoided. Columbia Public School's practice of allowing open lunches for high school students is considered to be an unsustainable model, particularly in the plan area.

The roadways leading to and surrounding the new high school are for the most part unimproved two-lane rural roads that are particularly hazardous for young drivers. In addition, there are currently, and for the foreseeable future, no restaurants or services in the vicinity, which will force students to travel many miles on rural roads, or use I-70, before reaching sufficient accommodations. Allowing open lunches will create an exceedingly dangerous situation not only for residents of the plan area but also for the students themselves. Based on these observations, the Joint Commission considers this avoidable situation unacceptable and strongly recommends a change in CPS policy related to the open lunch program. More immediate traffic concerns, such as present road conditions, are addressed in the transportation section of the plan.

As is evident from the comments received during the stakeholder meetings and observations of the Joint Commission, the location of the new high school site is impacted by many existing factors. Had other properties been more readily available for such a facility, many of these challenges may have been mitigated or avoided. Unfortunately, the location of the new high school site is determined, and plans for its construction are well underway. Acknowledging the challenges that exist and identifying opportunities to address them is critical. Overcoming the challenges that this site specifically poses will

need to be a coordinated effort between many parties and must take into account the surrounding land uses.

The Joint Commission believes that unlike high schools, elementary schools should be well integrated within residential neighborhoods and not located along major roadways. The need for an elementary school in the plan area is anticipated as residential development accelerates. A majority of elementary students live within walking distance of their school. For this reason, an elementary school should be centrally located within a residential development and should incorporate specific design elements, including a trail and sidewalk network, public parkland, and traffic-calming measures on the roads leading to the school. While this section has dealt primarily with schools, many of the concepts touched upon are also suitable as guidance for the selection of other public facility sites. Special consideration should be given to how accessible a site is to infrastructure, whether the site will be compatible or in conflict with adjacent uses, and how the site contributes to the overall service demands of the plan area. If anything has been learned from the new high school site selection process, it should be that more coordinated planning effort was needed. Such efforts will result in better site locations and more informed choices.

- **GOAL:** Create school campuses that are integrated into the land use pattern.
 - **Objective:** Develop the new high school in a way that addresses the concerns of adjacent landowners.
 - **Strategy:** Encourage CPS to adopt design standards that would mitigate traffic congestion, noise, parking lot storm water runoff, and lightings affect on adjacent properties.
 - **Strategy:** Encourage CPS to incorporate public parkland adjacent to the new high school to create green space and as a buffer between adjacent properties.
 - **Strategy:** Encourage the inclusion of non-motorized connectivity to adjacent neighborhoods, commercial developments, and the citywide trail network if feasible.
 - **Strategy:** Encourage CPS to keep students on campus by prohibiting the practice of open lunches at the new high school.
 - **Strategy:** Apply a sufficiency-of-services test using objective minimum criteria to assess the high school's impact on available or planned infrastructure.
 - **Strategy:** Ensure that appropriately sized essential services (water, electric, sewer, roads, parks, etc.) be in place or constructed concurrently with the new high school.
 - **Objective:** Integrate any future elementary schools within residential neighborhoods.
 - **Strategy:** Promote elementary school site selection within future neighborhoods to reduce transportation and infrastructure expenditures.
 - **Strategy:** Incorporate traffic calming designs into roadways that are adjacent to and in the vicinity of elementary schools.
 - **Strategy:** Encourage CPS to incorporate public parkland adjacent to elementary schools.
 - **Objective:** Improve coordination between the City, County, and CPS.
 - **Strategy:** Organize regular planning sessions between the County and City Planning & Zoning Commissions and CPS to gain understanding of future school site plans and needs.

- **Strategy:** Make available to CPS data on infrastructure expansion plans or land use issues considered to be relevant.
- **Strategy:** Provide advance notice of proposed developments to CPS for evaluation and comment.
- **Strategy:** Adopt a benchmark system for quantifying which developments may require additional school facilities.
- **Strategy:** Encourage greater CPS participation in the City and County's planning process.

TRANSPORTATION

By and large, the transportation network existing today and in the future will greatly influence land-use decisions for the plan area. Under the current conditions, the network is inadequate to safely support increased traffic demands. The Columbia Area Transportation Study Organization (CATSO), along with related entities, have long anticipated and planned for future roadways that will be needed in the plan area in response to future growth. Stakeholders have expressed concern about the safety of the current roads in the plan area and the timing of any upgrades as they relate to pending and desired future development. In response to these concerns, the following goals, objectives, and strategies are provided as guidance for improving the transportation network within the plan area. Additionally, alterations and additions to the CATSO 2030 Plan are being recommended with the aim of enhancing and increasing the efficiency of the existing transportation network.

The transportation network presently serving the plan area is inadequate to safely accommodate the new high school and desired new development. St. Charles Road is particularly unsafe, and the low-cost improvements being recommended are only a temporary fix that will still necessitate upgrading the road to major collector standards in the near future. The Route Z overpass will also need to be addressed in the near future. The overpass is in poor condition for accommodating the current traffic pattern and will be inadequate to support new school bus traffic, an increased number of passenger vehicles, and commercial trucks associated with the kinds of commercial or employment center development recommended by this plan. These two issues must be addressed before any new roadways are funded in the plan area.

Apart from addressing the current roadway conditions, adjustments to the proposed future roadway network should be considered to support the types of future development desired within the plan area. Using the CATSO roadway plan as a baseline, the Joint Commission has suggested alterations and additions to some of the planned roadways. The Joint Commission feels these changes better accommodate the new high school and the previously discussed land-use patterns called for in this sub-area plan.

Two notable changes to the current roadway plan are the extension of Clark Lane due east and the realignment of the proposed I-70 overpass along with its associated north-south roadway. The change in the extension of Clark Lane is recommended in an effort to define and preserve the larger parcels along I-70 for employment center development. The area that would lie between this extension and the existing ABC outer-lane would become the preferred location for employment center growth. By defining this area by these roadways, it would become possible for new development to face toward the I-70 corridor and have access for receiving facilities off extended Clark Lane. Improvement of extended Clark Lane is envisioned as a boulevard-style minor arterial that would be the extension of the existing Clark Lane terminating at Route Z.

The second notable change involves the realignment of the proposed overpass of I-70. The proposed change moves the overpass further west along the I-70 corridor to an alignment that would connect with Olivet Road south of the plan area boundary. This proposed change is recommended for its potential to increase opportunities for north-south traffic movements. Associated with the overpass realignment is a proposed change to the north-south corridor that presently runs east of the proposed high school site. This corridor is proposed to shift to the west side of the high school site to align with the new overpass location. The shift would be beneficial not only for north-south connectivity, but also due to the reduction in environmental impacts that would have resulted if the road were constructed as proposed.

- **GOAL:** Expand motorized and non-motorized transportation networks in an orderly, safe, and systematic manner based on existing plans and future demands.
- **Objective:** Circulate automobile traffic in a safe and orderly manner that is integrated with the land use pattern of the plan area.
- **Strategy:** Implement the low-cost improvements recommended by the City, County and University in the collaborative safety audit entitled "A Road Safety Assessment of St. Charles Road and Lake of the Woods Road in Boone County Missouri."

- **Strategy:** Upgrade St. Charles Road to major collector standards as soon as possible to accommodate the planned high school and related development.
- **Strategy:** Upgrade and widen the Route Z overpass to accommodate buses, increased passenger vehicle traffic, and trucks.
- **Strategy:** Abandon the ABC Lane configuration, as it exists in favor of the alignment depicted on the 2030 CATSO map and the Improve I-70 SEIS.
- **Strategy:** Coordinate CATSO and other roadway planning bodies to shift the current alignment of the proposed I-70 overpass and accompanying minor arterial road to align with Olivet Road to the South running along the West side of the new high school site, creating a North-South corridor that would extend all the way from New Haven Road to Route HH.
- **Strategy:** Protect Route Z right of way as a major arterial with limited access to facilitate a high volume of traffic along this north-south corridor.
- **Strategy:** Create attractive boulevard-style traffic corridors when upgrading any minor arterials, major arterials, and major collectors within the plan area.
- **Strategy:** Give special consideration to the intersection of Route Z and the current St. Charles Road to maintain the character of the historic structures located at this intersection.
- **Strategy:** Develop objective criteria requiring the preparation of a traffic impact study (TIS) prior to land use changes. Coordinate contents of such TIS with City and County Traffic Engineers and MoDOT representatives when evaluating development agreements.
- **Strategy:** Develop and/ adopt MoDOT access management and design guidelines to develop comprehensive site access standards.
- **Strategy:** Require the reservation of future transportation corridors when considering new developments in order to support the current planning efforts of the Columbia Area Transportation Study Organization (CATSO), Missouri Department of Transportation (MoDOT), and Columbia's Major Roadway Plan.
- **Strategy:** Rename St. Charles Road to preserve the continuity of the name Clark Lane from Paris Road to Route Z.
- **Objective:** Incorporate accessible non-motorized networks of trails and sidewalks into all new land developments and roadways.
 - **Strategy:** Incorporate trail and sidewalk networks that provide mobility within all new developments (residential, commercial, employment, school, and public facilities), and connectivity to adjacent developments, roadways, and the citywide trail network.
 - **Strategy:** Adopt comprehensive design standards for trail and sidewalk networks in all developments.
 - **Strategy:** Incorporate bike and pedestrian alternatives into all future roadways constructed in the plan area.

OPEN-SPACE AND PROTECTION OF THE NATURAL ENVIRONMENT

Just as growing communities need to upgrade and expand their built infrastructure (roads, sewers, utilities, etc.), so too they need to upgrade and expand their green infrastructure. A network of open space, woodlands, wildlife habitat, park, and other natural areas that sustain clean air, water, and natural resources and enrich residents' quality of life is a high priority for the plan area. The provision of adequate green space must be considered as necessary public facilities similar to utility services or roadway capacity. The goals, objectives, and strategies presented below are intended to provide the framework from which an enhanced open space inventory may be developed within the plan area.

An opportunity for building this open space inventory could begin by incorporating a public park into the new high school site design. From there, such an inventory should grow to the surrounding residential neighborhoods, where such spaces could be used to preserve sensitive areas such as streams, steep slopes, and tree cover. By encouraging such open spaces, the goals and objectives articulated throughout this plan, such as maintaining rural character, protecting the natural environment, creating buffers between dissimilar uses, and providing areas for parks and trail networks, would be achieved.

The preservation of such areas does have a cost to individual land owners and developers. However, it should be noted that some of these areas, such as steep slopes, are marginally suitable or unsuitable for development to begin with. Consideration should be given to changing the current practice of granting full open-space credit to these areas. This practice unintentionally encourages overly dense development directly adjacent to environmentally sensitive areas. It is also important that open space not be merely left without any functional purpose. When feasible, open spaces should be used to save existing tree cover and incorporate trails, parks, natural vegetation, and streams within their boundaries. Another strategy for preserving open space is the concept of Transfer of Development Rights (TDR) from one property to another. This market-based system helps to preserve large tracts of undisturbed land while allowing for dense development in designated areas. Although this strategy could be worthwhile for Boone County as a whole, the plan area is too small in scope to launch such an ambitious strategy.

- **GOAL:** Develop the plan area in a manner that protects the natural environment and existing land use patterns.
 - **Objective:** Mitigate the impact that new development will have on the natural environment of the plan area.
 - **Strategy:** Support the implementation and enforcement of stream and wetland buffer protection ordinances.
 - **Strategy:** Support the implementation and enforcement of storm water ordinances.
 - **Strategy:** Identify potential non-profit organizations or public-private partnerships that could acquire sensitive lands for permanent preservation.
 - **Strategy:** Adopt land disturbance ordinances that promote responsible and timely land disturbance.
 - **Strategy:** Encourage the utilization of the natural topography and stream buffers when planning the placement of trail networks and open spaces within developments.
 - **Objective:** Incorporate expanded open spaces in all new developments in order to mitigate their impact on the existing land use patterns and create buffers between dissimilar land uses.
 - **Strategy:** Any development adjacent to historic sites at the intersection of Route Z and St. Charles Road should incorporate adequate buffers to protect the character of these sites.

- **Strategy:** Offer incentives, such as density bonuses, that encourage developers to plan for a larger percentage of open space within their developments.
- **Strategy:** Develop landscaping/buffering requirements that encourage preservation of existing natural features.
- **Strategy:** Develop performance measures that quantify the amount and type of open space buffers required to separate dissimilar uses. Proximity, topography, and orientation of site improvements should be considered.

INFRASTRUCTURE COORDINATION

The community as a whole has consistently been frustrated with the poor timing of infrastructure upgrades, particularly roads, as they relate to new development. While the County applies a sufficiency-of-services test to give developments an objective rating as it relates to existing and planned infrastructure, the City has no such system. When city officials make land-use decisions, they have no objective basis by which to determine the appropriateness of some developments in terms of adequate infrastructure. This practice has led to increased infrastructure costs, urban sprawl, and “leapfrog” development.

Establishing methods by which infrastructure costs are shared equitably between all end users and the public will help ensure that development is guided by infrastructure and not the other way around. Such policies will also promote more efficient development patterns in which infrastructure systems are fully utilized before they are expanded to serve new developments. By using infrastructure to guide desired growth, the limited resources available for such infrastructure will be more efficiently allocated producing better overall growth management.

This subject deserves a comprehensive community discussion that holds developers, not taxpayers, responsible for servicing developments. The Joint Commission realizes that this issue is not unique to the plan area, but rather is a citywide policy issue. The Joint Commission believes that the issue must be addressed in the current comprehensive planning effort underway by the City of Columbia if true change in community growth planning is to occur. If the current policies for utility extension are allowed to continue, planning for desirable growth will be significantly more difficult and the unintended consequences of demand-driven utility expansion will greatly affect the quality of life for both County and City residents alike.

- **GOAL:** Adequately serve existing and new developments with appropriate infrastructure in a timely manner.
- **Objective:** Develop objective criteria that requires proposed developments be served by adequate existing or planned infrastructure to promote orderly growth and reduce undesired development sprawl.
 - **Strategy:** Apply a sufficiency-of-services test using objective criteria to assess the appropriateness of a proposed development’s impact on available or planned infrastructure when making land use changes.
 - **Strategy:** Approve land use changes to areas currently served by adequate infrastructure and deny land use changes in those areas that lack adequate services or plans for such services.
 - **Strategy:** Evaluate development approval practices and procedures to ensure that adequate infrastructure exists prior to or is built concurrently with new developments.

APPENDIX A

City of Columbia Visioning -

The following are items from the City of Columbia's Visioning document that were referenced in the writing of the Northeast Columbia Sub-Area Plan:

A. Arts and Culture

- Strategy 2, page 21: Apply best practice community design, aesthetics, and environmentally friendly planning.

B. Community Character

- Strategy 3, page 26: Be proactive, creative, and flexible about mixed-use zoning to encourage workable walking communities, and expand opportunities for farmers, gardeners, restaurateurs, service providers, and craft workers to sell and deliver produce and services.

E. Development

- Strategy 2, page 39: Redefine planning and zoning to make sure infrastructure implementation is aligned with the comprehensive growth plan.
- Goal, page 41: Land will be preserved throughout Columbia and Boone County to protect farmland, scenic views, natural topographies, rural atmosphere, watersheds, healthy streams, natural areas, native species, and unique environmentally sensitive areas, thereby enhancing quality of life.
- Strategy 1, page 43: Use the City's development planning process to promote socioeconomically diverse, mixed-use neighborhoods that are supported by citywide bicycle, pedestrian, and transit systems to reduce the need for automobile commuting.
- Strategy 8, page 49: Provide comprehensive transportation planning to direct and support growth and to interconnect neighborhoods that will form as a result of form-based zoning.

I. Environment

- Strategy 2, page 73: Preserve open space, farmland, natural beauty, and critical environmental areas using techniques promoted by the International City/County Management Association's publication, co-produced with the U.S. Environmental Protection Agency, "Getting to Smart Growth: 100 Policies for Implementation."

J. Governance and Decision Making

- Strategy 3, page 83: Enhance collaboration between City departments.
- Strategy 9, page 85: Increase collaboration and coordination between the City and the County.

K. Health, Social Services, and Affordable Housing

- Strategy 2, page 88: Implement incentive zoning that encourages residential developers to provide a percentage of affordable units within newly constructed communities.

L. Parks, Recreation, and Greenways

- Strategy 1, page 95: Use easements and development rights to promote the preservation of green space and the development of greenways.
- Goal, page 96: An extensive, safe network of trails will accommodate a variety of users ranging from recreational to non-motorized travelers. This network may include roadway and public transportation infrastructure to connect parks, neighborhoods, schools, and businesses.
- Strategy 2, page 96: Achieve trail connectivity in new and existing developments.

M. Transportation

- Goal, page 98: Columbia will enjoy a safe, interconnected, non-motorized transportation network. It will be culturally supported by citizens as it will encourage social interaction and healthy lifestyles. The roadway, sidewalk, public transport, and trail systems will all tie together into an effective integrated transportation network.
- Goal, page 99: Columbia will have diverse travel options that allow for safe and efficient travel to and through destination points. Travel options will be compatible with adjacent land uses and coordinated with the transportation timing needs of the community.

City of Columbia Metro 2020 References -

Metro 2020 “Neighborhood Commons” (see Appendix B)

Metro 2020 “Neighborhood Marketplace” (See Appendix C)

Document Terms and Definitions -

Community Improvement District

A Community Improvement District (CID) may be either a political subdivision or a not-for-profit corporation. CID's are organized for the purpose of financing a wide range of public-use facilities and establishing and managing policies and public services relative to the needs of the district.

Organizing A CID

A CID must be requested through petition signed by property owners owning at least 50% of the assessed value of the real property, and more than 50% per capita of all owners of real property within the proposed CID. The request can then be presented for authorizing ordinance to the governing body of the local municipality in which the proposed CID would be located. Language contained in the petition narrative must include a five year plan, describing the purposes of the proposed district, the services it will provide, the improvements it will make and an estimate of the costs of those services and improvements, and the maximum rates of property taxes and special assessments that may be imposed within the proposed district. Other information must state how the CID would be organized and governed, and whether the governing board would be elected or appointed. There are specific rules that provide the required elements of a CID petition, and the procedures for publication, public hearings, etc.

Supporting Organizations

Unlike a Neighborhood Improvement District, a CID is a separate legal entity, and is distinct and apart from the municipality that creates the district. A CID is, however, created by ordinance of the governing body of the municipality in which the CID is located, and may have other direct organizational or operational ties to the local government, depending upon the charter of the CID.

Typical Budget Items And Responsibilities

A CID may finance new facilities or improvements to existing facilities that are for the use of the public. Such public-use facilities include:

1. Convention centers, arenas, meeting facilities, pedestrian or shopping malls and plazas
2. Paintings, murals, fountains or kiosks
3. Parks, lawns, gardens, trees or other landscapes
4. Streetscapes, lighting, benches, marquees, awnings, canopies, trash receptacles, walls
5. Lakes, dams and waterways
6. Sidewalks, streets, alleyways, bridges, ramps, tunnels, traffic signs and signals utilities, drainage works, water, storm and sewer systems and other site improvements
7. Parking lots, garages
8. Child care facilities and any other useful, necessary or desired improvement

A CID may also provide a variety of public services, some of which may be:

1. Operating or contracting for the operation of parking facilities, shuttle bus services
2. Leasing space for sidewalk café tables and chairs
3. Providing trash collection and disposal services
4. With consent of the municipality, prohibiting, or restricting vehicular and pedestrian traffic and vendors on streets
5. Within a designated “blighted area”, contract with any private property owner to demolish, or rehabilitate any building or structure owned by such property owner
6. Providing or contracting for security personnel, equipment or facilities

Financial Resources

Funding of CID projects and services must be set forth in the requesting petition that is presented to the local governing body of the municipality in which the CID is located. District-wide special assessment, rents, fees, and charges for the use of CID property or services, grants, gifts or donations may accomplish funding. If the CID is organized as a political subdivision, property and sales taxes may also be imposed within the boundaries of the CID.

Neighborhood Improvement District

A Neighborhood Improvement District (NID) may be created in an area desiring certain public-use improvements that are paid for by special tax assessments to property owners in the area in which the improvements are made. The kinds of projects that can be financed through an NID must be for facilities used by the public, and must confer a benefit on property within the NID.

Local Government/Voter Initiative

An NID is created by election or petition of voters and/or property owners within the boundaries of the proposed district. Election or petition is authorized by a resolution of the governing body of the

municipality in which the proposed NID is located. Language contained in the petition narrative or ballot question must include certain information including, but not limited to a full disclosure of the scope of the project, its cost, repayment, and assessment parameters to affected property owners within the NID.

Typical Budget Items

1. Acquisition of Property
2. Improvement of streets, sidewalks, crosswalks and all related components
3. Drainage, storm and sanitary sewer systems and service connections from utility mains, conduits and pipes
4. Improvement of streetlights and street lighting systems
5. Improvement of waterworks
6. Improvement of parks, playgrounds and recreational facilities
7. Improvement of flood control works
8. Improvement of pedestrian and vehicle bridges, overpasses and tunnels
9. Landscaping streets or other public facilities including improvement of retaining walls and area walls on public ways
10. Improvement of property for off-street parking

Responsibilities And Challenges

Public hearings concerning the specifics of the project, its costs, and other specific information pertinent to the project must be conducted prior to commencement of work on any project of the NID so that any written or oral objections may be considered.

Tax Increment Financing

Local Tax Increment Financing (Local TIF) permits the use of a portion of local property and sales taxes to assist funding the redevelopment of certain designated areas within a community. Areas eligible for Local TIF must contain property classified as a "Blighted", "Conservation" or an "Economic Development" area, or any combination thereof, as defined by Missouri Statutes.

Typical Budget Items

TIF may be used to pay certain costs incurred with a redevelopment project. Such costs may include, but are not limited to:

- Professional services such as studies, surveys, plans, financial management, legal counsel
- Land acquisition and demolition of structures
- Rehabilitating, repairing existing buildings on site
- Building necessary new infrastructure in the project area such as streets, sewers, parking, lighting
- Relocation of resident and business occupants located in the project area

Supported by Local Tax Incremental Revenues

The idea behind Local TIF is the assumption that property and/or local sales taxes (depending upon the type of redevelopment project) will increase in the designated area after redevelopment, and a portion of the increase of these taxes collected in the future (up to 23 years) may be allocated by a municipality to help pay the certain project costs, partially listed above.

Responsibilities of the Governing Body of the Municipality and the Local TIF Commission

Missouri's TIF Act defines a "Municipality" as an incorporated city, town, village or county. The governing body of your municipality is required to establish a TIF Commission, composed of certain members including representatives of other local taxing authorities within the redevelopment project area as defined by state statute. The municipality is also responsible for the approval of ordinances (or resolutions if a county) that establish a comprehensive Redevelopment Plan, and for approval of the specific TIF Redevelopment Project. Responsibilities of the TIF Commission are many, and may include working with the local government in creating the Redevelopment Plan and TIF Redevelopment Project parameters, holding required public hearings, preparing economic impact reports and revenue projections, blight studies and other documents to justify the need for TIF and as required by state statutes governing Local TIF projects.

Transportation Development District

Creating A TDD

A Transportation Development District (TDD) may be created to act as the entity responsible for developing, improving, maintaining, or operating one or more "projects" relative to the transportation needs of the area in which the District is located. A TDD may be created by request petition filed in the circuit court of any county partially or totally within the proposed district. There are specific rules that provide filing procedures and content requirements of TDD creating petitions. Your Department of Economic Development will be happy to provide details of these rules upon request.

State Or Local Government Project Support

Before beginning to build or fund any project, the TDD will submit the proposed project to the Missouri Highways and Transportation Commission for its approval. If the proposed project is not intended to be part of the state highways or transportation system, the TDD will also submit its plans for approval by the local transportation authority that will become owner of the project. A "local transportation authority" may be any local public authority(s) or political subdivision(s) having jurisdiction over any transportation service, improvement, or infrastructure in which the TDD is located.

Typical Budget Items

A TDD serves to fund, promote, plan, design, construct, improve maintain or operate one or more "projects" or to assist in such activity. "Projects may include any:

- Street, highway, road, interchange, intersection, bridge, traffic signal light or signage;
- Bus stop, terminal, station, wharf, dock, rest area or shelter;
- Airport, river, or lake port, railroad, light rail or other mass transit and any similar or related improvement or infrastructure.

Financial Resources

Funding of TDD projects may be accomplished through the creation of District-wide special assessments or property or sales taxes with a required majority voter or petition approval. Other funding sources requiring voter majority approval may include establishing tolls or fees for the use of the project. The TDD may also issue bonds, notes, and other obligations in accordance with the authority granted to the entity for such issuance.

Transfer of Development Rights (TDR)

A transfer of development rights (TDR) is a program that can relocate potential development from areas where proposed land use or environmental impacts are considered undesirable (the “donor” site) to another (“receiver”) site chosen on the basis of its ability to accommodate additional units of development, beyond that for which it was zoned, with minimal environmental, social, and aesthetic impacts. A TDR procedure must be established by regulatory action of the elected body.

Sufficiency-of-Services Test Methodology

A Sufficiency-of-Services Test establishes a point rating system for evaluating infrastructure capacity when making land use decisions. Points are based on a variety of existing infrastructure elements including but not limited to; roadway conditions, type and adequacy of sewer, water services capacity, soil capabilities, proximity to urban centers, proximity to fire protection, and available school capacity. Ratings given to a proposal for land use change or subdivision are then provided to policy makers for consideration of the application.

Some governing bodies use these ratings as an advisory tool and others perform a regulatory function where proposals that do not meet minimum infrastructure thresholds are denied. Currently Boone County uses a rating system as an advisory tool, referred to as the Point Rating System, while the City of Columbia does not apply any test or rating of infrastructure capacity. The following are excerpts from Boone County’s Subdivision Regulations that outline the use of the Point Rating System. Boone County’s Point Rating System is not ideal but it does provide some guidance to Planning & Zoning Commissioners and County Commissioners concerning infrastructure adequacy when making land use decisions.

1.4.24 Point Rating System - A numerical rating system, approved by the Commission, based on urban development factors which assign point values to unincorporated areas of land.

1.4.40 Urban Service Area - All sections of and in unincorporated Boone County which have been assigned a numerical rating of 50 or more points by the currently approved Point Rating System.

1.8.4 Advisory Point Ratings for Major Subdivisions -In order to permit the Commission and to determine whether major subdivision development is proceeding in those areas with existing adequate infrastructure, as opposed to those areas which are undeveloped and do not possess substantial existing infrastructure, a point rating shall be assigned to each major subdivision plat under the Subdivision Point Rating System set forth in Table B of these regulations; it being the desire of the County Commission that each major subdivision have a point rating of at least 50 points under such system. However, such point rating system is maintained purely as an advisory and study tool, and shall not be used as a basis for accepting or rejecting approval of any major subdivision plat.

APPENDIX B

Neighborhood Common Development Concept

4.7 Neighborhood Common

The Neighborhood Common is intended serve as a central unifying element within a neighborhood. Its purpose is to serve as a focal point for neighborhood interaction and provide an amenity to the residents. Designed around a park or public space, the Neighborhood Common may include additional features such as a school or church, along with a limited number of small office and retail uses which serve the residents.

The Neighborhood Common should ideally be located in the center of the neighborhood. Other locations may be appropriate, such as the edge of the neighborhood, if it can be demonstrated that the alternate site better serves the residents. A Neighborhood Common is not to be located on arterial streets or at their intersections with other streets and are is not intended as to serve as commercial area for the community as a whole.

The inclusion of a Neighborhood Common is elective. The design should allow for a mix of uses and densities separate from single family homes yet integrated into the neighborhood. The design of the Neighborhood Common is flexible enough to support many of the attributes of a traditional neighborhood design.

A Neighborhood Common may vary in size from two to seven acres in size, based upon the typical neighborhood model, or from one to four percent of the total neighborhood area. Public parks and schools designed into the Neighborhood Common are exempted from the acreage and percentages guidelines. In larger neighborhoods, more than one Neighborhood Common may be appropriate.

Land use and activities for the Neighborhood Common include some of the following:

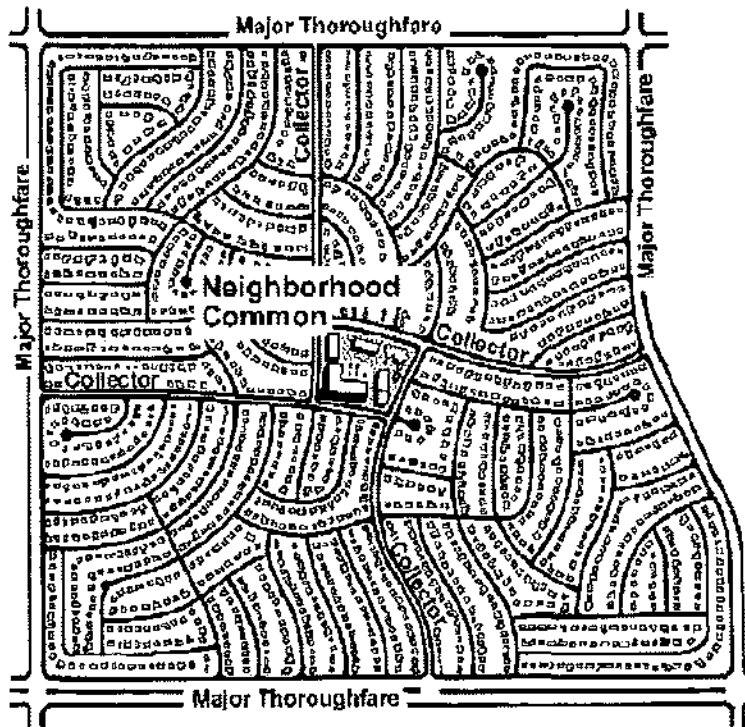
- a. Park or public space (public or private)
- b. Recreation facility
- c. School
- d. Children's or adult day care
- e. Church, mosque, synagogue
- f. Small professional offices and clinics
- g. Neighborhood market
- h. Other small businesses
- i. Attached single family or multi-family residential

Ideally, each neighborhood would include a Neighborhood Common that provides a park or a public space that serves as a year-round gathering place and focal point. The park or public space may be either public or private. The public space may be a square, plaza, pavilion, or other outdoor space accessible to all residents. If nonresidential uses are included, the park and/or public space should be an integral element of the Neighborhood Common, located in an attractive setting, highly visible and easily observed from public streets.

The following compatibility guidelines, in addition to those for the Neighborhood District, should apply to the planning and development of a Neighborhood Common:

1. Planned zoning district (O-P or C-P) for office and retail uses;
2. Total land area for non-residential uses should not exceed two acres;
3. Maximum percentage of impervious cover is seventy percent for nonresidential uses;
4. All rezoning requests for O-P or C-P should be accompanied by a site plan submitted for approval which covers the entire Neighborhood Common. The site plan should detailed building locations, all required parking, landscaping, and public space as well as a list of uses and any architectural controls being imposed.
5. Cut or fill for grading beyond the building footprint or for a parking area should be compatible with any nearby residential lots; and when completed, blend to match the surrounding topography.
6. When feasible, a landscaping strip should be included along the foundation of all buildings in areas not paved for delivery vehicle access or direct pedestrian access to an entrance/exit.
7. The total nonresidential building square footage and the approved uses for the C-P or O-P site plan should generate no more than 1,000 ADT for all the combined uses.
8. Total building square footage for nonresidential uses should be no more than thirty percent of the lot or building site.

Model Neighborhood with Neighborhood Common

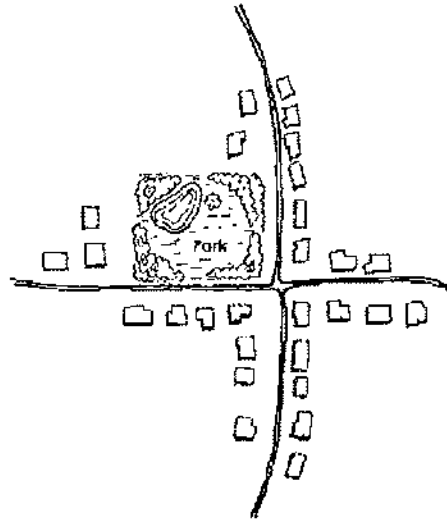


Adapted from Guide Plan for Columbia; Hare & Hare, 1966

9. Nonresidential buildings should provide space for multiple tenants and uses.
10. A total of thirty percent open space is desirable for the Neighborhood Common overall.
11. Floodplain and/or other unbuildable areas included as part of the park or public space should support the overall design of the Neighborhood Common.
12. All nonresidential uses should have limited signage requirements and attract no more than a limited amount of traffic from outside the neighborhood.

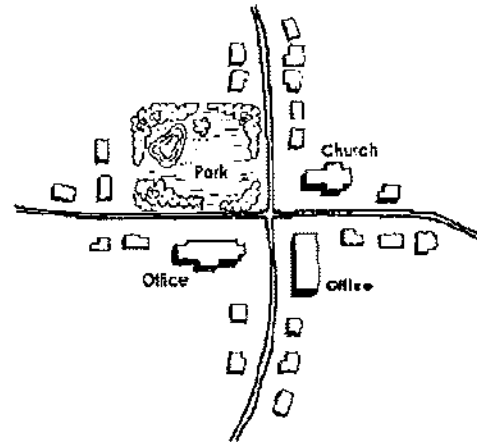
Neighborhood Commons Prototypes

The Neighborhood Common is intended as a central unifying element within a neighborhood.

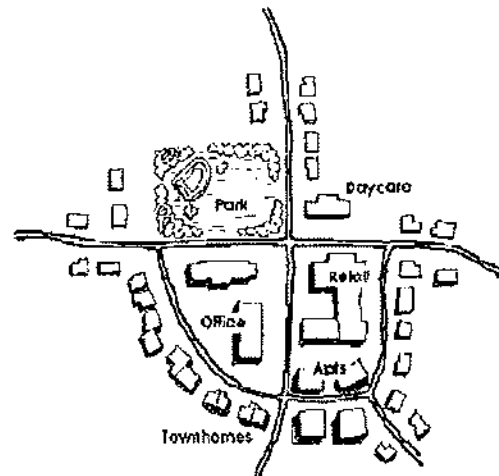


Neighborhood Common, With 2 Acre Park

Neighborhood Common; With 2 Acre Park, Church, and Small Offices for total of 5 acres



The Neighborhood Common provides for a mix nonresidential uses and housing types separate from single family homes yet integrated into the neighborhood.



Neighborhood Common; With 2 Acre Park, Daycare, Small Offices, Retail and Apartments for total of 7 acres

APPENDIX C

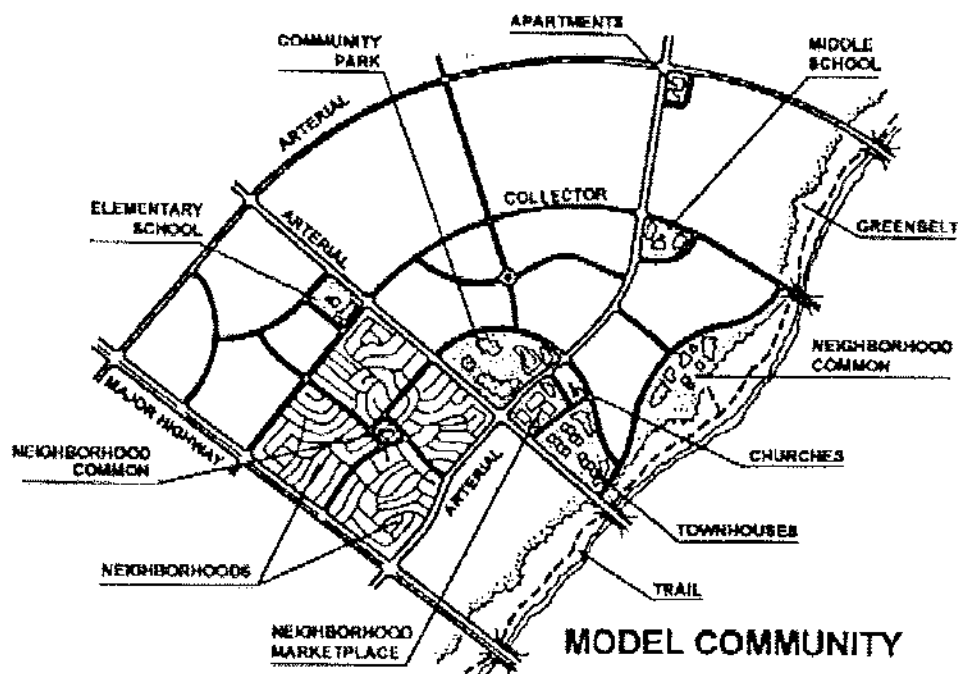
Neighborhood Marketplace Development Concept

4.8 Neighborhood Marketplace

At specific locations along arterial streets, a Neighborhood Marketplace with retail uses serving several neighborhoods and higher density residential uses may be appropriate, if developed at a scale compatible to the surrounding area. A Neighborhood Marketplace should be centrally located within the residential areas to be served by the retail uses, preferably at the intersection of arterial streets that are neighborhood boundaries. Neighborhood Marketplaces should be separated by at least two miles and are intended to serve a population of 5,000 to 20,000 within a given market area. The Neighborhood Marketplace provides for the sale of day-to-day needs and should be built around a primary tenant. The Neighborhood Marketplace should be between 30,000 and 100,000 square feet of gross leaseable area and contain a mix of retail and office uses. Ideally, the primary tenant would be a grocery store containing approximately 40,000 square feet of retail space. Other services may include small office uses, sit-down restaurants, specialty retail uses and service station/car wash, along with high-density multi-family residential. At the intersection of two arterial streets, a total of 60,000 to 200,000 square feet of nonresidential uses may be appropriate, provided that no single development exceeds the 100,000 square foot guideline for nonresidential uses. High-density multi-family housing and other housing types may be included as an element of the Neighborhood Marketplace. The location of Neighborhood Marketplace within the neighborhood district necessitates a scale and style of development which will insure compatibility within the neighborhood setting. The following compatibility guidelines, along with those for the Neighborhood District, should be applied to the planning and development of a Neighborhood Marketplace:

1. Planned zoning district (O-P or C-P) for office and retail uses and PUD for residential.
2. A single Development Plan should apply to the entire site.
3. Sufficient street frontage for the Neighborhood Marketplace should be provided so that appropriate spacing exists for driveways on to an arterial street, especially if access to the arterial would be by driveway. Driveways should be designed to serve all uses within the development. Joint use driveways and cross easements are encouraged.
4. Controlled access onto arterial streets. Driveways should be appropriately spaced based upon accepted traffic engineering standards, with no more than two driveways per lot. Driveways should not be located within the operational area of an existing or future signalized intersection.
5. Access should be provided through a system of internal streets or parking aisle.
6. Pedestrian access to and from the Neighborhood Marketplace should be provided in a safe and convenient manner from the sidewalk system along the arterial(s). The Neighborhood Marketplace provides for the sale of day-to-day needs and should be built around a primary tenant, ideally, a grocery store.
7. Buildings are encouraged to be located so that a percentage of the building front(s) is directly adjacent to the street and provide a pedestrian-oriented site design.
8. All street locations should be appropriately spaced from any arterial intersection based upon accepted traffic engineering standards. Streets should not be located within the operational area of an existing or future signalized intersection.

9. Access to all parking areas for individual buildings should be provided from an internal system for traffic circulation.
10. The maximum percent of impervious cover should be no more than seventy percent for any tract or lot.
11. Cut or fill for grading beyond the building footprint or for a parking area should be compatible with any nearby residential lots; and when completed, blend to match the surrounding topography.
12. Pedestrian connectivity through parking lots should be an integrated into the overall design of the Neighborhood Marketplace and connect all businesses within the development.
13. A reduction in the number of required parking spaces may be appropriate when the development has a centralized parking area shared by all uses. Additional landscaped area in lieu of parking is encouraged.
14. The landscaping should be specifically designed to integrate and relate to the surrounding residential environment. The quality of the landscaping should highlight and enhance the development and the residential area it serves.
15. When feasible, a landscaping strip should be included along the foundation of all buildings in areas not paved for delivery vehicle access or direct pedestrian access to an entrance/exit.



Adapted from Guide Plan for Columbia; Hare & Hare, 1966

APPENDIX D

A Road Safety Assessment of St. Charles Road and Lake of the Woods Road in Boone County, Missouri

**A ROAD SAFETY ASSESSMENT OF ST. CHARLES ROAD AND LAKE OF
THE WOODS ROAD IN BOONE COUNTY, MISSOURI**

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Date of Road Safety Assessment site visit: April 10, 2008

Expected project completion date: May 31, 2008

Road Safety Assessment Team:

Brian Chandler	Missouri Department of Transportation
Jacob Ray	Missouri Department of Transportation
John Schaefer	Missouri Department of Transportation
Donald Neumann	Federal Highway Administration
Scott Sergent	City of Columbia Police Department
Charlie Oestrich	Columbia Public Schools Board
Dianne Heckemeyer	Linn State Technical College
Britt E. Smith	Jefferson City, Missouri
Charles Nemmers	University of Missouri
Praveen Edara	University of Missouri
Ginger M. Rossy	University of Missouri

Background information provided by:

Richard Stone	City of Columbia
David Mink	Boone County Public Works
Keith Austin	Boone County Public Works

I. Background

The City of Columbia and Boone County in cooperation with the Missouri Department of Transportation (MoDOT) requested the University of Missouri (MU) to develop a protocol and perform Road Safety Assessments (RSA) for two low-volume roads in its jurisdiction and to suggest low-cost improvements for these roads. The roads assessed in this study were the St. Charles road and the Lake of the Woods road. Both the roads are located in the northeast corner of the City of Columbia and share a stop-controlled intersection (see Figure 1).

The MU study team proceeded to collect background information on the construction and utilization of the two roads as well as information of reported accidents. It was found that the two roads are classified as rural minor arterial collectors. The roads were asphalt paved in place and there was no design specified for the construction of shoulders or special drainage systems. The average daily traffic (ADT) for the Lake of the Woods road is 4,148 vehicles per day¹ and the ADT for the St. Charles road is 9,076 vehicles to the west of the intersection with the Lake of the Woods road and 2,179 to the east of the same intersection. A fire station is located at the intersection of the two roads and a golf course is located less than half a mile to the east of the same intersection off St. Charles Road.

The chosen study area included the whole length of the Lake of the Woods Road (approximately 1.5 miles) and the segment of the St. Charles Road between the Lake of the Woods road and the Route Z (approximately 2.5 miles). There were a total of 23 reported vehicular accidents that occurred in the study area. None of the accidents were fatal, however, there was one that produced a disabling injury (see the attached sketch in Appendix A). From the accident reports it was seen that the majority of them occurred at the intersection of the two roads being studied and at the intersection between St. Charles road and Route Z. Other accidents occurred at the intersections of the Lake of the Woods road with private property entrances, as well as by hitting objects located at the sides of the roads.

One of the major concerns regarding safety in the study area is the future construction of the new City of Columbia High School to the west of the Lake of the Woods golf course. The high school is expected to have about two thousand (2,000) students and numerous teachers and administrative personnel by its proposed completion date in August 2010. The increase in the average daily traffic in addition to the presence of inexperienced drivers in the traffic could have safety implications and the city and the county are interested in identifying these implications.

¹ Extracted from Boone County Public Works internet page www.showmeboone.com/PW. Vehicle counts for Lake of the Woods Rd. performed in 2006. Vehicle counts for St. Charles Rd. performed in 2003 for west side and 2007 for east side.

II. Methodology

For this pilot project, the MU study team decided to follow the guidelines provided by the National Cooperative Highway Research Program (NCHRP Synthesis 336) on performing RSAs. According to the guidelines, a team of experts in different aspects of road safety should perform a field visit to the roads being assessed. For this study, the participants were chosen from various organizations in order to gain different perspectives. The following organizations were represented: Federal Highway Administration, MoDOT, City of Columbia Police Department, Columbia Public Schools Board, Jefferson City Public Works, Linn State Technical College, and University of Missouri-Columbia. Since the City of Columbia and Boone County Public Works were the clients and primary stakeholders they were not included in the RSA team. The names and contact information of each participant is shown in Table 1.

Road Safety Assessment Team Members	Organization Represented
Brian Chandler	Missouri Department of Transportation
Jacob Ray	Missouri Department of Transportation
John Schaefer	Missouri Department of Transportation
Donald Neumann	Federal Highway Administration
Scott Sargent	City of Columbia Police Department
Charlie Oestrich	Columbia Public Schools Board
Dianne Heckemeyer	Linn State Technical College
Britt E. Smith	Jefferson City, Missouri
Charles Nemmers	University of Missouri
Praveen Edara	University of Missouri
Ginger M. Rossy	University of Missouri

Table 1: Road Safety Assessment Team members and affiliation.

The RSA team members (the team) met to perform the site visit on April 10, 2008 at 10:00 am at the MoDOT Columbia office located on Route B. After the formal introductions, the MU researchers proceeded to inform the team of the purpose of the investigation and the background information. After a questions and answer session, the members of the team were given a prompt list consisting of items the participant needs to look for while performing the site visits (see Appendix B). The prompt lists are only intended to provide cues to the participants about the common items that are reviewed in a RSA and are not intended to be comprehensive. A sketch of the study area with a summary of the accidents report was also provided to the participants.

At 11:15am the team boarded a university owned van and proceeded to the study area. Although the weather conditions during the field visit were clear, it has to be noted that there was major rainfall during the night before that ended a few hours before the field visit. The team arrived at the intersection of St. Charles Road and Lake of the Woods Road at 11:25 am and inspected the whole length of the project, pausing to take photos

and perform more detailed inspections at few intermittent locations and at intersections. The field visit concluded at 12:30 pm after which the study team gathered for a meeting to discuss the findings from the field visit. The meeting was adjourned at 2:00pm.

III. RSA Team Comments

This section summarizes the findings of the RSA team and makes suggestions for safety improvements in the study area.

A. Intersection of Lake of the Woods road and Route PP

- a. Findings: The alignment on the Lake of the Woods road may not have the necessary sight distance to recognize the presence of an intersection (with Route PP). In addition, the stop sign located at this intersection is placed too low and is offset from the road for the drivers to be able to appreciate it in the northbound approach (see Photo 1). The stop sign and the road identification sign are in poor condition (see Photo 2). There is no adequate drainage on the sides of the pavement and there is no stop bar on the pavement. There are signs of pavement damage at this intersection probably caused due to the lack of proper drainage.
- b. Suggestions for improvement: 1) Improve drainage, 2) Replace or repair stop sign by making sure it complies with the latest MUTCD standards of size and height, 3) Increase awareness of intersection by installing a flashing device to attract attention to the stop sign, 4) Place a stop ahead sign or stop approach rumble strips indicating that vehicle is approaching an intersection, 5) Improve the lighting at the intersection.

B. Curves on Lake of the Woods Road and the intersections with minor rural roads and private property entrances

- a. Findings: There is limited sight at curves in the Lake of the Woods Road (see Photo 3). Sign height does not seem to comply with the MUTCD standards. There are signs that have faded and lost reflectivity, therefore their information is difficult to understand. Entrances to private properties and rural roads are not easily identified (see Photo 4). The intersections of Lake of the Woods Rd. and minor rural roads lack stop signs. Many fixed objects such as utility poles, trees, and mailboxes are located close to the pavement edge. Since there are no shoulders on the road, residents have to stand on the pavement while checking their mailboxes. There is some pavement damage near the mailbox locations (see Photo 5). Grades along the driving surface change frequently which inhibits proper sight distance (see Photo 6). At least one unused traffic sign was observed. The sign informed that left-turn is not permitted to a road that is no longer on service.

- b. Suggestions for improvement: 1) Install chevrons on curves, 2) Install 'intersection ahead' signs to warn drivers of intersections with rural roads, 3) Relocate mailboxes further inside private properties, 4) Reduce the number of trees that are located close to the pavement, 5) Provide pavement edge markings and shoulders, 6) Check for adequacy of signs with respect to MUTCD standards and replace damaged ones, 7) Check for compliance with stopping sight distance requirements (geometrical design), 8) Improve drainage along the road.

C. Culvert crossing on Lake of the Woods Road

- a. Findings: There is a steep drop from the rolling surface onto a creek that crosses Lake of the Woods Rd. near its intersection with Waterfront Dr. (see Photo 7). Few other steep ditches were noticed on the same road.
- b. Suggestions for improvement: 1) Consider adding a guardrail over the culvert as this drop is considerably steep, 2) Improve drainage along the road.

D. Intersection of Lake of the Woods Rd. and St. Charles Rd.

- a. Findings: The intersection is three legged with stop signs on each approach. Sight distance is limited from the southbound approach on Lake of the Woods Rd. A "T" intersection ahead sign is located close to the actual intersection on Lake of the Woods Rd.

The size of the stop signs seemed smaller than the usual. Some members of the team informed not being able to recognize the presence of the stop sign for traffic on the St. Charles Rd. During the inspection, few vehicles were observed to fully stop before entering the intersection. However, most vehicles made a rolling stop.

The intersection between St. Charles Rd. and Player Pl. is close to this intersection. Entrances to private properties are also close to the intersection. The only lighting provided at the intersection is located about half a block away to the west, near the entrance to the fire station.

There are no markings on the pavement other than double line median separation. There are sidewalks provided only on the south side of St. Charles Rd. Utilities and mailboxes are located near the intersection.

Pavements are rutted and water was collected over the pavement (see Photo 8).

- b. Suggestions for improvement: 1) Verify the adequacy of stop signs and consider installing oversized signs, 2) Replace or complement "T" intersection-ahead sign on north leg of the intersection with a stop-ahead sign, 3) Consider improving the lighting at the intersection, 4) Verify that

sidewalks comply with ADA requirements, 5) Draw stop bars on the pavements and consider including stop approach rumble strips indicating that the driver is approaching an intersection.

- c. Suggestions for long term improvements: 1) Consider repaving the intersection to eliminate rutting and prevent the possibility of drivers losing control of vehicles because of loss of traction of the vehicle tires as a result of water accumulated in ruts (hydroplaning), 2) Consider adding a separate left turn bay for the eastbound movement from St. Charles Rd. into Lake of the Woods Rd., 3) Limit the movements into neighboring roads that are located near the intersection, 4) Consider replacing the intersection with a roundabout as a method for traffic calming (which is expected to be needed when the new high school opens).

E. St. Charles Rd.

- a. Findings: The road is wide enough for striping into three lanes in the segment between its intersection with Lake of the Woods Rd. and the entrance to the Lake of the Woods golf course. Most of this segment is paved with concrete and has sidewalks on the east bound side. There is an edge drop-off along the concrete pavement on the westbound side.

After the intersection with the Cooper Creek Subdivision, the road becomes narrow and is paved with asphalt. The speed limit increases from 35 mph to 45 mph in the narrow segment. There are no pavement edge markings, no shoulders, and no adequate drainage ditches (see Photo 9). Several agricultural field entrances are covered from view by dense vegetation.

There are several curves on the road. There were at least two curves that displayed speed signs less than the posted speed limit (of 45mph) for the road (35mph and 40 mph). Dense bushes and trees limit the visibility at these curves. Some trees have markings suggesting vehicle impacts from run-off roadway accidents. Utility poles were located less than two feet from the pavement edges. Traffic signs are worn, have lost reflectivity, and appear to be about 5 feet high. One No-Left Turn sign points to a road that no longer exists.

- b. Suggestions for improvement: 1) Replace most of the signs and verify for compliance with the MUTCD, 2) Reduce the amount of bushes and trees within close proximity to the pavement edges, especially near curves, 3) Install chevrons at curves, 4) Improve drainage ditches and consider building shoulders or curb and gutter structures, 5) Provide edge lines for the entire route, 6) Revise compliance of posted speed limit with current sight distance requirements and adjust the speed limit accordingly, 7)

Remove signs that are no longer necessary, 7) Sidewalks will be required after the completion of the new High School.

F. Intersection between St. Charles Rd. and Route Z

- a. Findings: The intersection between St. Charles Rd. and Route Z is controlled by stop signs only on the approaches of St. Charles Rd. The eastbound and westbound approaches of St. Charles Rd. are not aligned. The speed limit on Route Z is 55 mph. Dense vegetation obstructs the visibility of the stop sign on the eastbound approach (see Photo 10). There are no stop bars on the pavements. There are serious drainage problems at the intersection and water accumulates at the sides of the intersection (see Photo 11), hence making it difficult for the St. Charles Rd. traffic to accelerate after turning right onto Route Z. There are no shoulders or sidewalks on any intersection approach.

Drivers that stop on the eastbound approach are not able to see the oncoming traffic from the north due to the presence of a large barn-like structure obstructing the view (see Photo 12). Drivers are forced to move further into the intersection to be able to see the oncoming traffic. The same occurs on the westbound approach due to a different reason - trees block visibility of the southbound traffic (see Photo 13).

- b. Suggestions for improvement: 1) Reduce the speed limit on Route Z near the intersection, 2) Add stop signs for Route Z, 3) Improve drainage, especially on the southwest quadrant of the intersection, 4) Remove vegetation to make stop signs visible from a distance, 5) Add edge markings and stop bars on the pavements, 6) Install signs to identify Route Z, 7) Install speed limit signs on Route Z, 8) Verify compliance of existing signs with the MUTCD regulations, 9) Consider larger size signs.
- c. Suggestions for long term improvements: 1) Study possible ways to remove offset of approaches in St. Charles Rd., 2) Consider replacing the intersection with a roundabout which would act as a traffic calming treatment.

IV. Suggestions for performing future RSAs

The methodology for this project included, 1) searching for information on the construction and operation of the St. Charles and Lake of the Woods roads, 2) selecting a multidisciplinary team for evaluating the safety of the roads, 3) performing a site visit, 4) collecting the comments provided by the evaluating team and producing a report of the current conditions and possible solutions for improving safety on these roads. After the completion of the aforementioned tasks the following comments and suggestions are given to plan for future Road Safety Assessments.

- A. Background information: The following list of information proved to be useful for evaluating the roads prior to the site visit
 - a. Detailed road maps and aerial maps
 - b. Road construction plans
 - c. Sign inventories and/or traffic control devices locations
 - d. Accident reports
 - e. Future development plans
 - f. Interviews with city and county officials
 - g. Interviews with concerned agencies and groups
- B. Evaluation team: A multidisciplinary team composed of state and federal transportation officials (MoDOT and FHWA), law enforcement (City of Columbia PD), concerned agencies (Columbia Public Schools Board), academia (University of Missouri and Linn State Technical College), and external evaluators (Jefferson City) provided alternative views on how to approach solutions for the safety issues encountered in the site visit. This team was larger than the proposed 3-5 member teams suggested by the NCHRP guidelines.
- C. Site visit: It is recommended to provide a map to each team member with an appropriate scale for them to be able to write comments directly on it. This way the team members could focus more on evaluating safety hazards than on drawing sketches or writing long verbal descriptions. In addition, this could provide future reference to the exact location of a feature that needs corrections.
- D. Interviews with road users: It could be beneficial to perform interviews with road users to collect information on situations that can occur on conditions other than those under which the site visit was performed (for example ice on the roads and night visibility). Short interviews could be performed at intersections or by visiting residences and commercial establishments.

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