



LEE'S SUMMIT

MISSOURI

DEVELOPMENT REVIEW FORM

TRANSPORTATION IMPACT

DATE: January 3, 2023 **CONDUCTED BY:** Brad Cooley, PE, RSP1
SUBMITTAL DATE: October 11, 2022 **PHONE:** 816.969.1800
APPLICATION #: PL2022327 **EMAIL:** Brad.Cooley@cityofls.net
PROJECT NAME: HEARTLAND MARKET - LEE'S SUMMIT **PROJECT TYPE:** Prel Dev Plan (PDP)

SURROUNDING ENVIRONMENT (*Streets, Developments*)

The subject development is generally located to the east of where M-291 north and I-470 converge at NE Colbern Road. The project site is within the northeast quadrant of NE Colbern Road and NE Rice Road, west of the existing Mid-Continent Public Library. The subject property is bound by Colbern Road to the south, Rice Road to the west, commercial services to the immediate north with undeveloped agricultural-zoned property further north.

ALLOWABLE ACCESS

The proposed development is planned to be primarily accessed from Colbern Road with two new access points connecting to two new streets; Lucky Road and Ikerd Road. Lucky Road is planned to be constructed approximately 500' east of existing Rice Road, extending north from Colbern, and aligns with the City's Thoroughfare Master Plan (TFMP). Lucky Rd. is a planned commercial collector that extends north of the subject property, ultimately terminating at NE Todd George Parkway. The subject development plans to construct Lucky to their north property line, intersecting with Ikerd Road with a temporary knuckle cul-de-sac until future development north continues Lucky Road, per the TFMP. Lucky Rd. will be constructed to City standards including sidewalk, curb and gutter, and a pavement section adequate to accommodate the necessary turn lanes.

Ikerd Road is planned to be constructed approximately 350' north of Colbern Road, extending east from Rice and terminating at Lucky Rd. Ikerd is a local road constructed with sidewalk and curb and gutter.

The two proposed access points to this development are planned to enter the site from the two new roads, also proposed with this development. The east most access point along Lucky Rd. is approximately 175' north of Colbern Rd. and the north access point along Ikerd is approximately 200' east of Rice Rd.

EXISTING STREET CHARACTERISTICS (*Lanes, Speed limits, Sight Distance, Medians*)

NE Colbern Road is a 5-lane, median-separated, east-west major arterial with a 40-mph speed limit. Colbern Rd. intersects with the M-291 off-ramps just west of the subject property.

I-470 and M-291 are classified as Interstate and Principal Arterial, respectively, which are both owned and maintained by MoDOT.

NE Rice Road is a 2-lane, undivided, north-south commercial collector with a 45-mph speed limit.

ACCESS MANAGEMENT CODE COMPLIANCE?Yes No

The subject development will utilize two new streets adjacent to the project site. Both proposed streets are planned to be spaced sufficiently per the City's Access Management Code (AMC). The project site proposes two new access points; one on Lucky Road and one on Ikerd Road. The access point on Ikerd Road is located approximately 200' from Rice and is spaced sufficiently per the AMC. The access point on Lucky Road is proposed to be constructed approximately 175' north of Colbern Road and does not provide sufficient space per the AMC.

The AMC also provides guidance for throat length and curb radii. The access point on Ikerd and Lucky should have a minimum throat length of 75- and 100-feet, respectively. The access point of Ikerd provides 120-feet and meets the requirement. However, the access point on Lucky only provides a throat length of 50', short of the required length. The provided traffic study analyzed the 95th percentile queue for this restricted access and determined 25' was required.

The curb radii designed for both access points meet the City's requirements. However, the curb radii shown on Lucky at Colbern are designed at 25 feet which does not comply with the City's AMC.

TRIP GENERATION

Time Period	Total	In	Out
Weekday	6,930	3,465	3,465
A.M. Peak Hour	493	246	247
P.M. Peak Hour	426	213	213

The trip generation above was estimated by using the ITE Trip Generation Manual, 11th edition. Code 945 - C-Store/Gas Station for a 5,400 s.f./16 fueling position facility.

TRANSPORTATION IMPACT STUDY REQUIRED?Yes No

The proposed development will likely generate more than 100 vehicle trips to the surrounding street system during a peak hour based on industry standard methods for trip generation estimates, a minimum requirement for traffic impact study in the Access Management Code. A traffic impact study was prepared by Renaissance Infrastructure Consulting, dated November, 2022. The traffic study was prepared to assess traffic impacts associated with the development and to provide public improvement recommendations or waivers requested by the development that mitigate delay and/or meet minimum standards defined by City and/or MoDOT policies.

The traffic study evaluated existing conditions and proposed development conditions of the subject convenience store development. The analysis included morning and evening commuter peak hours at the intersections of; M-291 NB Ramp and Colbern Road, Colbern Road and Rice Road, Colbern Road and Todd George Parkway, Colbern Road and Lucky Road, Rice Road and Ikerd Road, and Lucky Road and the Proposed East Driveway. There was no scenario accounting for approved and unbuilt projects or future development of property on the northeast quadrant of the nearby interchange.

The traffic study looked at each intersection for turn lane requirements based on classification and projected turning movements. The available space and storage lengths were reviewed in coordination with the required turn lane lengths to provide recommendations for the subject development. The study found that the following turn lane improvements would be required;

1. The westbound left-turn lane on Colbern at Lucky should be increased to 200 feet plus taper.
2. The eastbound left-turn lane on Colbern at Lucky should be increased to 200 feet plus taper. The eastbound left-turn lane should be designed to support U-Turn movements.
3. A westbound right-turn lane on Colbern at Lucky should be constructed with a storage length of 150 feet and a taper length of 150 feet, starting prior to and extending through the library entrance.
4. The westbound left-turn lane on Colbern at Rice should be constructed with a storage length of 135 feet plus taper.
5. Construct a northbound left-turn lane on Lucky at Ikerd with a storage of 60 feet plus taper.
6. Construct a southbound left-turn lane on Lucky at Colbern with a storage length of 125 feet plus taper.

While multiple turn lanes are recommended shorter than the required length, per the AMC, the traffic study provides justification and adequate storage for the anticipated queue lengths.

The traffic study looked at each noted intersection to be analyzed for traffic operations and assigned a Level of Service (LOS) associated with their delay. Level of Service (LOS) is an industry accepted performance measure for traffic operations based on delay represented by the A to F lettered scale, with A the best and F the worst. City policy has established a LOS goal C for traffic signal operations and LOS D (where LOS E and F may be acceptable) for stop controlled movements. MoDOT has a similar performance standard, but LOS D is acceptable for signal operations. These LOS targets indicate acceptable operational performance or adequate operational conditions for the transportation network.

In addition to measured vehicle delay, vehicle queues were analyzed. With exception of the northbound Rice at Colbern and north- and southbound Lucky at Colbern, all other existing movements meet the desired LOS goals. The traffic study shows that northbound Rice Rd. exists as a LOS F with a queue length exceeding the available storage during the P.M. Peak Hour. The traffic study recommends installing a raised median along Colbern Road to restrict Rice Rd. to right-in-right-out (RIRO). This will eliminate the through and left-turn movements lowering the queue length and time. The north- and southbound movements for Lucky at Colbern resulted in a LOS F with the southbound queue length exceeding the available distance in the AM scenario, adding the queue length for the northbound movements being inadequate in the PM scenario. The traffic study did a traffic signal warrant study and has recommended constructing a signal at this intersection. Considering both stop-controlled and signal-controlled movements, the traffic study resulted in acceptable LOS and queue lengths with a signal-controlled intersection. No other traffic improvements are recommended to mitigate delay or queue impacts from the proposed development.

The traffic study has been submitted to MoDOT but no record of acceptance has been provided. The City will require that the study and any proposed improvements to MoDOT right-of-way be approved and accepted by the state.

The proposed preliminary development plan includes all Livable Streets elements identified in the City's adopted Comprehensive Plan, associated Greenway Master Plan and Bicycle Transportation Plan attachments, and elements otherwise required by ordinances and standards, including but not limited to sidewalk, street connectivity and accessibility. No exceptions to the Livable Streets Policy adopted by Resolution 10-17 have been proposed.

RECOMMENDATION: **APPROVAL** **DENIAL** **N/A** **STIPULATIONS**

Recommendations for Approval refer only to the transportation impact and do not constitute an endorsement from City Staff.

Staff recommends approval of the proposed preliminary development plan subject to the conditions noted below:

1. The curb return of Lucky Road at Colbern Road should be increased to 35 feet to meet the City's requirements.
2. Construct a raised median, 4' in width, should be constructed along Lucky Road to restrict the east access point to right-in-right-out.
3. Construct a westbound left-turn lane on Colbern Rd. at Rice Rd. with a storage length of 135 feet plus taper.
4. Construct a northbound left-turn lane on Lucky Rd. at Ikerd Rd. with a storage length of 60 feet plus, taper.
5. Construct a southbound left-turn lane on Lucky Rd. at Colbern Rd. with a storage length of 125 feet.
6. Construct a westbound and eastbound left-turn lane on Colbern Rd. at Lucky Rd. with a storage length of 200 feet plus taper.
7. The intersection of Colbern Rd. and Lucky Rd. be design and constructed in a way that supports eastbound left U-Turn movements.
8. Construct a westbound right-turn lane on Colbern Rd. at Lucky Rd. with a storage length of 150 feet plus a 150-foot straight-line taper. The taper should start prior to the existing library driveway and extend through it.
9. Install a traffic signal at the intersection of Colbern Rd. and Lucky Rd.