# LEE'S SUMMIT
MISSOURI

## DEVELOPMENT REVIEW FORM
## TRANSPORTATION IMPACT

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|---|---|---|---|
| **DATE:** | July 1, 2020 | **CONDUCTED BY:** | Michael K Park, PE, PTOE |
| **SUBMITTAL DATE:** | June 9, 2020 | **PHONE:** | 816.969.1800 |
| **APPLICATION #:** | PL2020134 | **EMAIL:** | Michael.Park@cityofls.net |
| **PROJECT NAME:** | LSR7 MIDDLE SCHOOL #4 | **PROJECT TYPE:** | Prel Dev Plan (PDP) |

**SURROUNDING ENVIRONMENT** *(Streets, Developments)*

The proposed development is located along the south side of Bailey Road, west of Ranson Road/Route RA and east of Hamblen Road. The existing undeveloped property is surrounded by single family residential subdivisions to the west and north, and agricultural/planned low-density single-family residential property to the east and south.

**ALLOWABLE ACCESS**

The proposed development will be accessed from two driveways along Bailey Road and driveways from the extension of existing public streets.

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

Bailey Road is a two-lane, undivided, 35 mph minor arterial that aligns in an east-west direction between Ranson Road/Route RA and M291 Highway with a grade separated railroad overpass just west of Hamblen Road. The roadway then continues westward to Ward Road as Persels Road. The intersection of Bailey Road at M291 Highway is traffic signal controlled and various turn lanes exist at the intersections of M291 Highway, Hamblen Road, and Hamblen Road/Century Drive. Intersections along Bailey Road, except as described below, are one-way or two-way stop controlled with Bailey Road having the assigned right-of-way. Bailey Road is also a designated Greenway and Bike Route.

Ranson Road/Route RA is a north-south MoDOT facility from US50 Highway to the State's James A. Reed Wildlife Conservation Area. It has a grade separated diamond interchange at US50 Highway approximately 1/2-mile north of Bailey Road with traffic signal control on the highway ramps. Ranson Road/Route RA continues north of US50 Highway as Todd George Parkway; a four-lane City major arterial. Otherwise, south of US50 Highway Ranson Road/Route RA is generally a two-lane, undivided, 40 mph/45 mph, minor arterial that continues to Greenwood. Multiple turn lanes exist at the intersections of Ranson Road/Route RA/Todd George Parkway with US50 Highway, Blue Parkway (North Highway Frontage Road), Oldham Parkway (South Highway Frontage Road), and several residential street intersections. While the interchange at US50 Highway is traffic signal controlled, only Blue Parkway within the interchange area is also traffic signal controlled. Oldham Parkway within the interchange area warrants a traffic signal and is planned in association with approved development. The intersection of Bailey Road at Ranson Road/Route RA is a "T" configuration with Baily Road stop controlled. All other intersections along the corridor are also one-way or two-way stop controlled; Ranson Road/Route RA with assigned right-of-way. Ranson Road/Route RA is also an identified link in the City's Greenway Master Plan and Bicycle Transportation Plan.

Hamblen Road is a north-south, undivided, two-lane minor arterial that extends from US50 Highway to Bailey Road. At and north of the grade separated, traffic signal controlled, diamond

interchange at US50 Highway, Hamblen Road becomes M291 Highway, a MoDOT facility. Hamblen Road is then offset to the east at Bailey Road where it aligns with Century Drive and continues south into Greenwood. The speed limit on Hamblen Road varies from 35 mph to 40 mph. Turn lanes exist at several intersections. Traffic signals are located at the highway frontage roads, Blue Parkway and Oldham Parkway, along Hamblen Road/M291 Highway. A traffic signal is under construction at the western intersection of Hamblen Road and Bailey Road. The eastern intersection of Hamblen Road/Century Drive and Bailey Road is an all-way stop.

Sight distance is adequate all the aforementioned street intersections.

**ACCESS MANAGEMENT CODE COMPLIANCE?** **YES** ☒ **NO** ☐

All Access Management Code criteria, including driveway spacing, intersection alignment, and turn lanes have been met or will be met with the improvements listed as recommended stipulations for approval. Proposed driveways along Bailey Road align with existing intersections or have been adequately separated from existing intersections to avoid conflicts. Access also considered maintained opportunity for adjacent property development and adherence to long-range transportation plans (Thoroughfare Master Plan). Furthermore, the existing dead-end roadways abutting the proposed development will be extended and/or properly terminated.

**TRIP GENERATION**

| Time Period | Total | In | Out |
|---|---|---|---|
| Weekday | 2,808 | 1,404 | 1,404 |
| A.M. Peak Hour | 749 | 404 | 345 |
| P.M. Peak Hour | 250 | 108 | 142 |

Trip Generation tabulated above includes the proposed middle school and athletic complex. Additional trip generation information for the school release time period and trips projected independently for each land use during all time periods analyzed are provided in the submitted traffic impact study.

**TRANSPORTATION IMPACT STUDY REQUIRED?** **YES** ☒ **NO** ☐

The proposed development will likely generate more than 100 vehicle trips to the surrounding street system during a weekday peak hour. Trips were estimated based on industry standard methods for trip generation. The expectation of 100 new trips (or more) to the surrounding street system meets the minimum threshold for traffic impact study in the Access Management Code. A traffic impact study was prepared by Olsson, dated May 8, 2020. The traffic study was done to assess traffic impacts associated with the development and to provide public improvement recommendations that support the project. The traffic impact study was concurrently submitted to MoDOT and the City for review. The City and MoDOT have completed a review of the traffic study and concur with the study and its recommendations.

The traffic study scenarios included existing conditions, proposed development conditions, and planned (future) development conditions of the subject middle school with athletic complex and adjacent undeveloped property to the east. Existing conditions were assumed to include approved development under construction near the study intersections (i.e. Princeton Retirement Living and Culver's along Oldham Road) as well as any improvements conditioned upon those developments approved. The analysis periods included morning and evening weekday commuter peak hours and a school release peak hour. Intersections analyzed were Bailey Road at Ranson

Road, Bailey Road at Hamblen Road (west), Bailey Road at Century Drive/Hamblen Road (east), Ranson Road at Oldham Parkway, Ranson Road at US 50 Highway, and all existing/proposed driveways to the site.

Intersection analysis compares proposed development conditions to existing conditions and all operations based on City and MoDOT established performance goals for measuring adequate infrastructure. The City has adopted a level of service (LOS) standard "C" for overall traffic signal operations; where individual traffic movements may be at LOS D or worse. Level of Service for stop controlled movements should be at least "D", but LOS E and LOS F may be acceptable. MoDOT has a similar performance standard, but LOS D is an acceptable benchmark for signal operations on their system. These performance goals, or minimum conditions of adequate infrastructure, help to identify public improvement needs associated with development for safer and efficient travel. Level of Service is an industry accepted standard measure of traffic performance based on experienced or calculated delay and driver/user comfort rated on a scale from A to F, where A represents the best and F the worst. Other improvement needs may be identified based on vehicle queuing and minimum code criteria, guidelines and standards that address transportation operations and safety (e.g. turn lanes, sight distance, intersection spacing, alignment, etc.). In consideration of previously completed traffic studies submitted to the City and MoDOT, and aforementioned approved development in the area, the intersection of Ranson Road at Oldham Parkway was assumed to have traffic signal control in all scenarios. Similarly, all scenarios assumed the traffic signal at Hamblen and Bailey currently under construction would be in operation.

An assessment of existing conditions indicate acceptable levels of service for all studied intersections except for the stop controlled movements as noted below:

- Eastbound traffic LOS E and LOS F, AM and PM Peak Hours respectively, along Bailey Road at Hamblen Road/Century Drive
- Eastbound traffic LOS F and LOS F, AM and PM Peak Hours respectively, along Bailey Road at Ranson Road/Route RA.

These instances of poor level of service cannot reasonably be mitigated but for a change in traffic controls. The intersection of Bailey Road and Hamblen Road/Century Drive does not meet traffic signal warrants for existing conditions, but it is closely approaching the minimum warranting traffic volumes. The intersection of Bailey Road at Ranson Road/Route RA meets traffic signal warranting conditions; consequently, a traffic signal is recommended for existing conditions and absent traffic signal control the infrastructure is inadequate for development. If these two intersections were traffic signal controlled, all reported levels of service will meet established performance goals. Alternatively, roundabouts could be constructed to achieve similar, acceptable, operations. Several turn lanes otherwise required by codes, standards, etc. are currently not present at some study intersections. These turn lanes were not required when the intersections were constructed. Traffic operations remain adequate absent the turn lanes for existing conditions.

Estimated trips generated by the proposed development were projected onto existing conditions and analyzed. For this scenario, warranted and recommended new traffic signals were assumed in operation. Those recommended traffic signals include:

- Bailey Road at Ranson Road/Route RA.
- Bailey Road at Hamblen Road/Century Drive.

Though analysis of a roundabout alternative to traffic signal control was not studied, it could provide acceptable levels of service. In consideration of these improvements and various turn

lanes recommended in the traffic study, all LOS is acceptable post development except the intersection of Ranson Road/Route RA/Todd George Parkway at US50 Highway Westbound Ramp. Those recommended turn lanes in support of the proposed development or turn lanes in association with recommended traffic signals in support of the proposed development include:

- Eastbound and Westbound right-turn lanes with a storage length of 200 feet plus taper at Ranson Road and Bailey Road.
- Continuous Northbound right-turn lane between the Eastbound US50 Highway Ramp (south ramp terminal) and Oldham Parkway. (MoDOT has agreed to waive this improvement recommendation in consideration of other state projects and approved development improvements planned at Oldham Parkway)
- Eastbound and Westbound left-turn lanes with a storage length of 250 feet plus taper at Bailey Road and Hamblen Road/Century Drive.
- Southbound left-turn lane with a storage length of 150 feet plus taper at Bailey Road and Hamblen Road/Century Drive.
- Northbound left-turn lane with a storage of 200 feet plus taper at Ranson Road/Route RA and Bailey Road.
- Westbound left-turn lane with a storage of 200 feet plus taper at Drive 1 (Western School Driveway) and Bailey Road.
- Westbound left-turn lane with a storage of 200 feet plus taper at Drive 2 (Eastern School Driveway) and Bailey Road.
- Construct Drive 2 with a width of 42 feet having one entering lane and two exiting lanes. (This has been depicted on the development site plan.).

The traffic signal at Ranson Road/Route RA/Todd George Parkway and US50 Highway Westbound Ramp has a projected LOS E during the morning peak hour when trips from the proposed development are distributed. According to the report, this is a resulting LOS with average delays still less than one minute and attributed to a westbound left turn movement that has LOS F and vehicle queues that approach 500'. The existing conditions worsen with development, but the poor operation is only experienced during the AM Peak Hour. No improvements are recommended at this intersection to accommodate the proposed development and MoDOT concurs.

Other recommendations noted in the study in support of the proposed development not already listed above include:

- Traffic signal interconnect between the adjacent traffic signals.
- Coordinate potential pedestrian/bicycle needs with the City to ensure that the proposed access points accommodate the potential planned off-street path along Bailey Road and crossing maneuvers, if necessary.
- Verify sight distance at both proposed driveways.
- Consider a school zone speed limit during school arrival/dismissal periods.

An analysis scenario was also included in the study that projected trips from adjacent undeveloped property onto the study intersections. The proposed development does not inhibit the development of adjacent property and provides access to such property in conformance with the Thoroughfare Master Plan and Access Management Code. The recommended improvements associated with the proposed development also provide benefit to future adjacent development. Any further improvements needed in association with future development would be assessed at that time. The purpose of this scenario was to ensure the proposed development does not create an impediment, considers opportunities for shared infrastructure improvements, and/or to better coordinates improvement needs.

Staff and MoDOT concur with the study findings and recommendations. The transportation improvements recommended in the study are consistent with and included in the Staff recommended stipulations for approval listed at the end of this report.

**LIVABLE STREETS** *(Resolution 10-17)* **COMPLIANT** ☒ **EXCEPTIONS** ☐

The proposed 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, shared-use path, neighborhood connections, long-range roadway planning, bike routes, landscaping, parking, 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 as depicted in the application subject to the following off-site transportation improvements that must be substantially completed prior to occupancy:

1. Traffic signal installation at the intersection of Oldham Parkway and Ranson Road/Route RA. (This improvement is currently planned by others.)
2. Traffic signal installation or roundabout construction at the intersection of Bailey Road and Ranson Road/Route RA.
3. Traffic signal installation at the intersection of Bailey Road and Century Drive/Hamblen Road (east).
4. Construct an eastbound right-turn lane at the intersection of Bailey Road and Ranson Road/Route RA with a storage length of at least 200 feet plus taper. This turn lane improvement is not applicable if the intersection is a roundabout.
5. Construct a northbound left-turn lane at the intersection of Bailey Road and Ranson Road/Route RA with a storage length of at least 200 feet plus taper. This turn lane improvement is not applicable if the intersection is a roundabout.
6. Construct a southbound right-turn lane at the intersection of Bailey Road and Ranson Road/Route RA with a storage length of at least 200 feet plus taper. This turn lane improvement is not applicable if the intersection is a roundabout.
7. Construct a westbound left-turn lane at the intersection of Bailey Road and Eastern School Driveway with a storage length of at least 200 feet plus taper.
8. Construct a westbound and eastbound left-turn lane at the intersection of Bailey Road and Western School Driveway each with a storage length of at least 200 feet plus taper.
9. Construct a westbound left-turn lane at the intersection of Bailey Road and Century Drive/Hamblen Road (East) with a storage length of at least 250 feet plus taper.
10. Construct an eastbound left-turn lane at the intersection of Bailey Road and Century Drive/Hamblen Road (East) with a storage length of at least 250 feet plus taper.
11. Construct a southbound left-turn lane at the intersection of Bailey Road and Century Drive/Hamblen Road (East) with a storage of at least 150 feet plus taper.
12. Extend the existing northbound left-turn lane along Ranson Road at Oldham Parkway to provide a minimum storage length of 150 feet, plus taper in compliance with City and/or MoDOT standards. (This improvement is currently planned by others.)

13. Traffic signal interconnect between the intersections of Oldham Parkway at Ranson Road/Route RA, Ranson Road/Route RA/Todd George Parkway at US 50 Highway, Bailey Road at Ranson Road/Route RA, Bailey Road at Century Drive/Hamblen Road, and Bailey Road at Hamblen Road.
14. Verify and mitigate any sight distance obstructions along Bailey Road associated with the School Driveway(s)
15. Installation of Solar Powered School Zone Flasher Assembly (2) for the establishment of School Zone with Reduced Speed Limit along Bailey Road, if so and where determined applicable by decision of the City Traffic Engineer. If a decision by the City Traffic Engineer is not conveyed to the applicant prior to the substantial completion of all other required transportation improvements, it shall not be required at all.
16. Coordinate improvements along Bailey Road to incorporate planned Greenway (Shared-Use Path) and Bikeway (Bike Lane/Paved Shoulder) in accordance with adopted Greenway Master Plan and Bicycle Transportation Plan; including potential bicycle and pedestrian intersection/access crossing maneuvers, where necessary.

Conditions of approval pertaining to state rights-of-ways (e.g. Ranson Road/Route RA) may be waived or modified or other improvements added at the discretion of MoDOT for MoDOT's approval of permitted work. The listed recommendations applicable to MoDOT ROW are based on MoDOT's review and comment of the development plan and associated traffic impact study. Any waiver, modification or new condition provided by MoDOT shall be documented to the City in substitute for the satisfaction of conditions prior to occupancy.