

APPENDIX A

Route Profiles

Lawrence Transit System

ROUTE 1

Downtown to Prairie Park

SERVICE DESIGN

Route 1 is a Lawrence Transit route that operates between the downtown transit hub and Prairie Park. The route travels primarily along Connecticut Street, 11th Street, Haskell Avenue, 19th Street, Harper Street, and 27th Street (Figure 1). Route 1 provides service to Downtown Lawrence and multiple social service agencies: Lawrence Municipal Court, the Department of Children and Families, and the Lawrence-Douglas County Housing Authority.

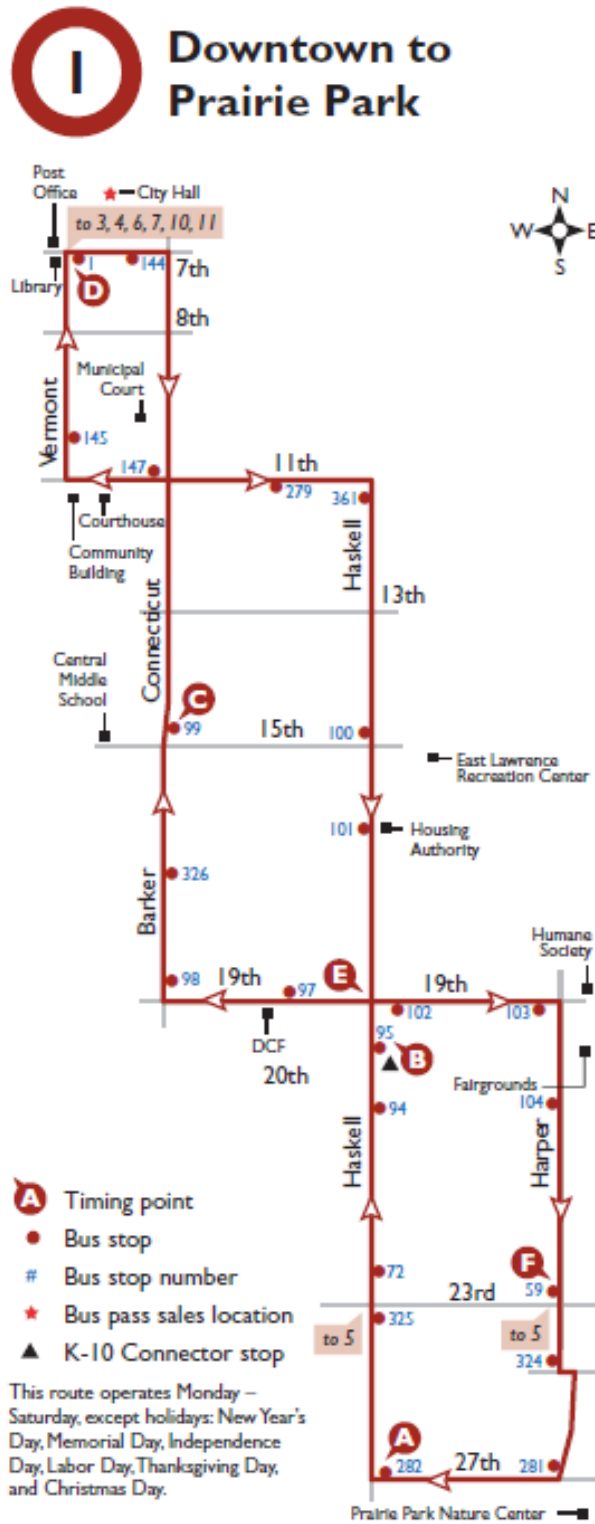
ALIGNMENT/SERVICE PATTERNS

Route 1 has one service pattern for weekday and Saturday service. Departing outbound from the intersection of 7th Street and Vermont Street in Downtown Lawrence, Route 1 turns right on 7th Street, right on Connecticut Street, left on 11th Street, and then right on Haskell Avenue. Outbound service continues south on Haskell Avenue, and then left on 19th Street, right on Harper Street, right on 27th Street, and terminates at the intersection of 27th and Haskell Avenue.

Returning inbound from 27th Street and Haskell Avenue, Route 1 turns right on Haskell Avenue, left on 19th Street, and right on Barker Avenue, which becomes Connecticut Street after crossing 15th Street. Route 1 continues on Connecticut Street, and then turns left of 11th Street, right on Vermont Street, and terminates near the intersection of 7th Street and Vermont Street.

As of August 1st, 2016, Route 1 serves the Lawrence Community Shelter and no longer loops to serve Connecticut Street and Barker Avenue, or Haskell Avenue south of 19th Street.

Figure 1 | Route Map



Source: Lawrence Transit, August 2015-July 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 1 and several Lawrence Transit routes at the downtown transit hub. There are also transfer opportunities at several other points along the route, including along 23rd Street (Route 5); transfers to the K-10 Connector, operated by Johnson County Transit, are available on Haskell Avenue (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Downtown Transit Hub	Route 3, Route 4, Route 6, Route 7, Route 10, Route 11, Route 15
Haskell Avenue & 23rd Street	Route 5, Route 15
Haskell Avenue & 19th Street	K-10 Connector
Harper Street & 23rd Street	Route 5, Route 15

SERVICE SCHEDULE

Route 1 operates service Monday-Saturday (Figure 3) year round. On weekdays and Saturdays the route runs every 30 minutes from 6:03 AM to 7:59 PM. Route 1 does not operate on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:03 AM – 7:59 PM	30	28/28
Saturday	6:03 AM – 7:59 PM	30	28/28
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 1 ranks fifth of nine Lawrence Transit routes in terms of weekday ridership and seventh of nine in terms of ridership per trip (Figure 4). On average, the route carries 205 passengers, or 3.7 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 1 carries 148 passengers, or 2.6 per trip.

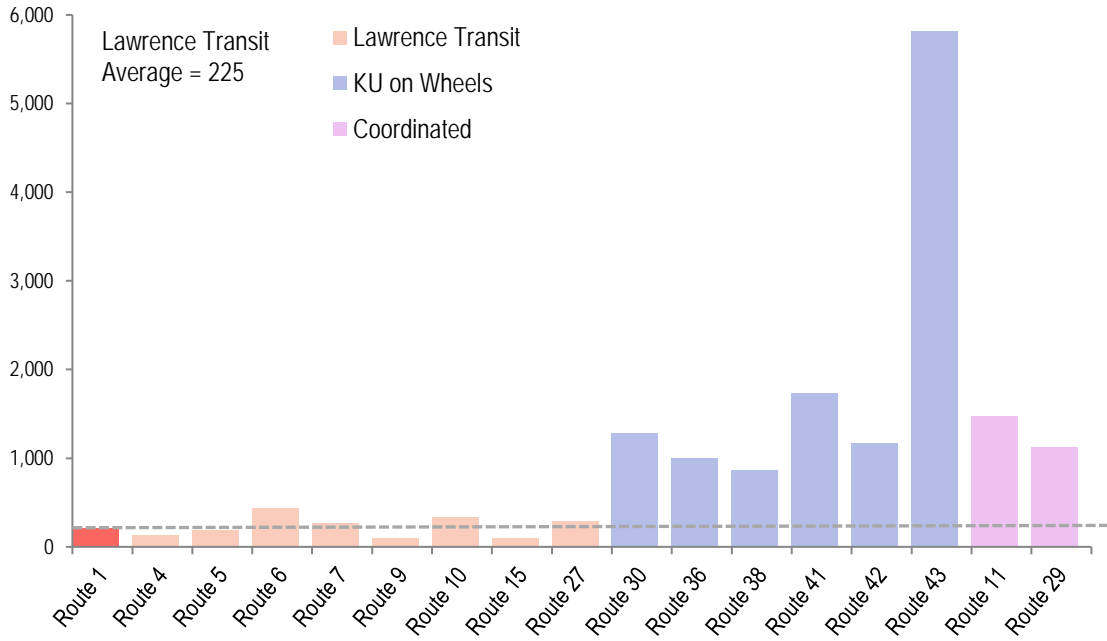
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	205	56	3.7	6.5	7 of 9
Saturday	148	56	2.6	4.7	7 of 8

Source: Lawrence Transit, 2016

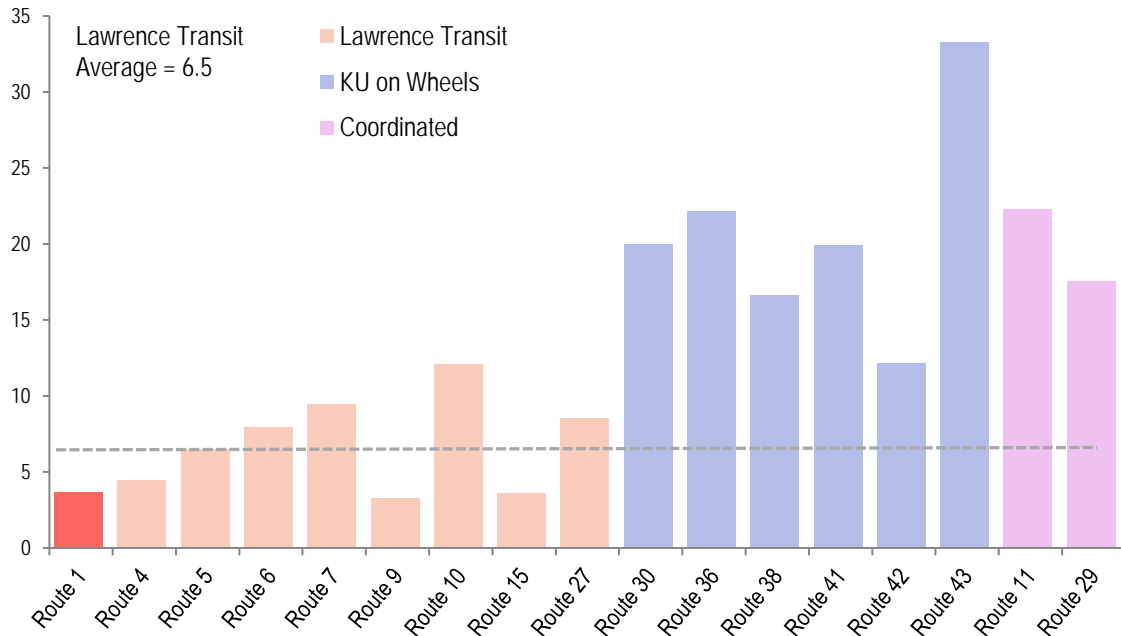
ROUTE EVALUATION | ROUTE 1
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

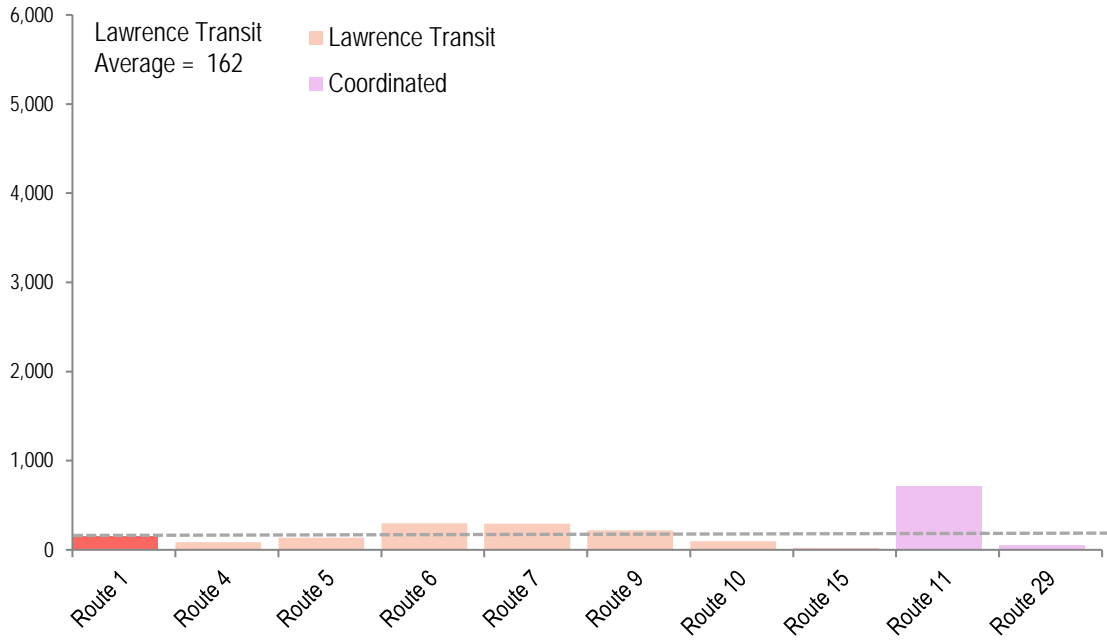
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

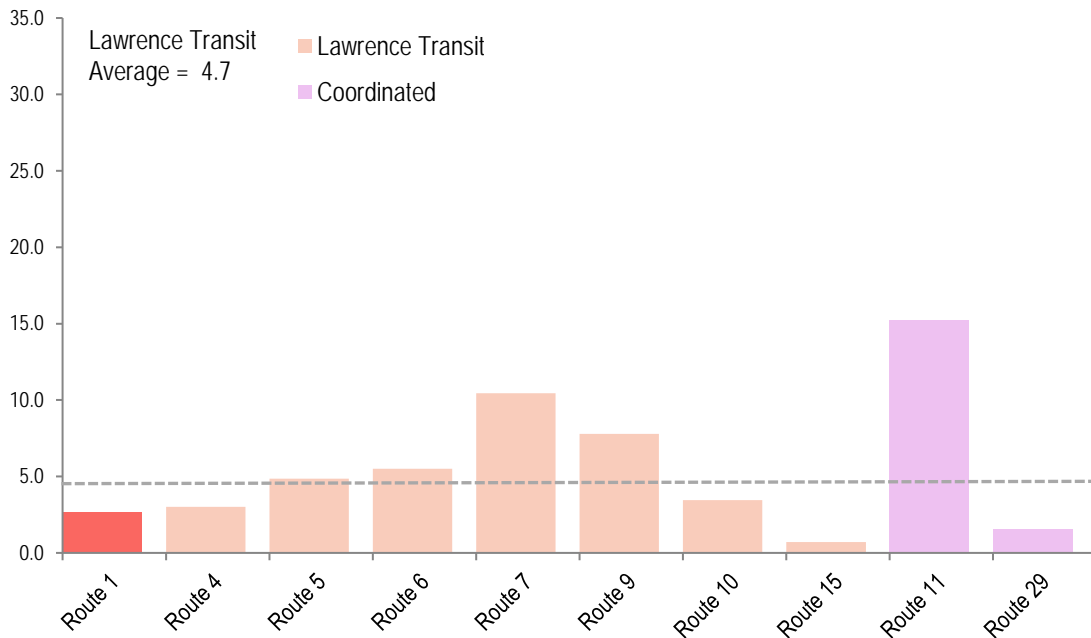
ROUTE EVALUATION | ROUTE 1
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 1 are located along Haskell Avenue and in Downtown Lawrence (Figure 9). Combined boardings and alightings peak at the terminating stop at 7th Street and Vermont Street, with 81 alightings. Other stops with more than 10 boardings and alightings per weekday include: 23rd Street and Haskell Avenue, Haskell Avenue and Pinecone Drive, 19th Street and Delaware Street, 10th Street and Vermont Street, and 11th Street and Connecticut Street. These stops serve residential areas (Pine Tree Townhouses), retail locations along Haskell Avenue, and Downtown Lawrence. All other stops serve fewer than 10 boardings and alightings (Figure 10-Figure 13).

Saturday ridership patterns are similar to weekday patterns, but with significantly lower volumes (Figure 18-Figure 21). Ridership activity on Saturday is concentrated at the final two stops, 10th Street and Vermont Street and 7th Street and Vermont Street.

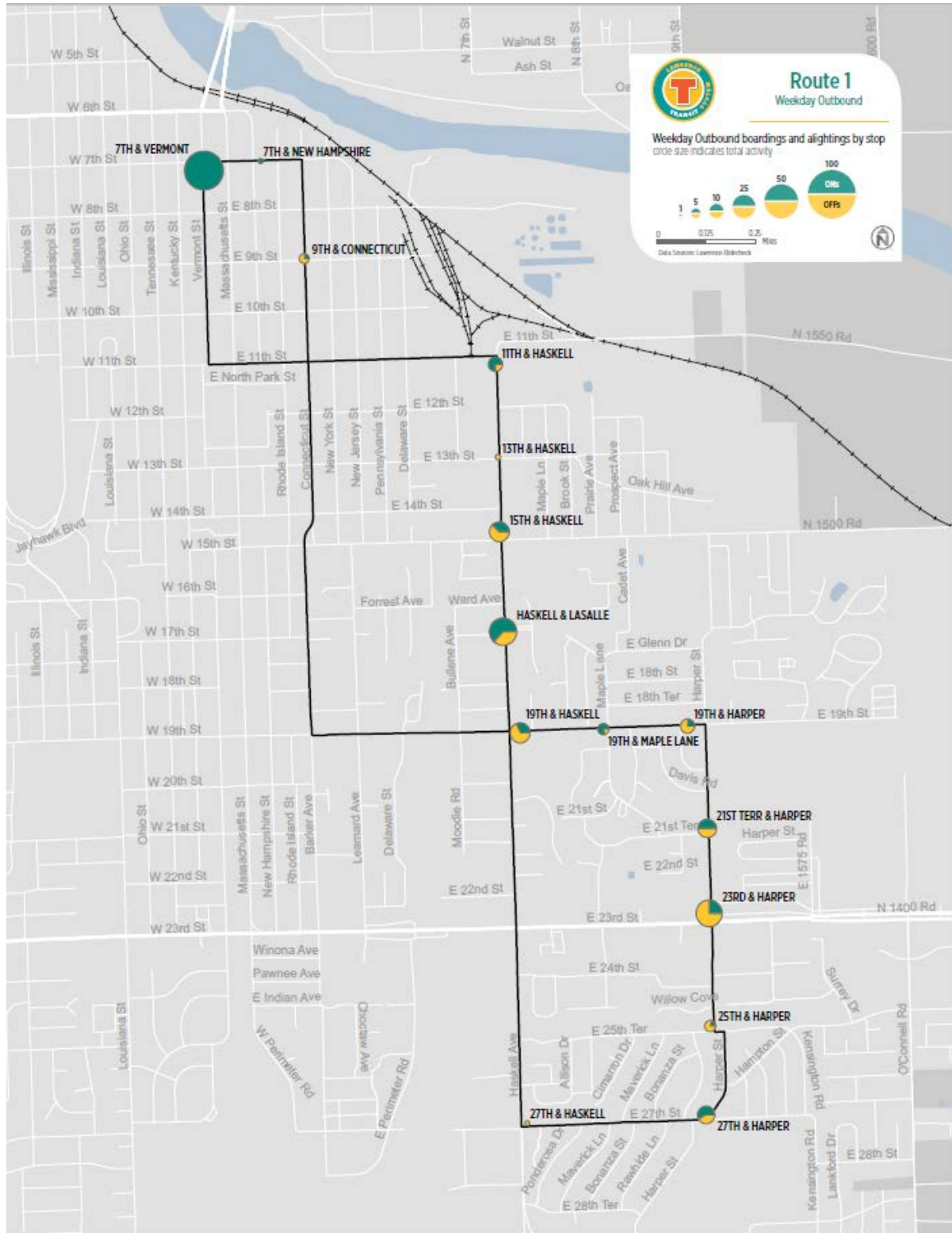
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
23rd Street / Haskell Avenue	33	Local retail stores; Haskell Indian Nations University
Haskell Avenue / Pinecone Drive	19	Residential neighborhood, including Pine Tree Townhouses
19th Street / Delaware Street	18	Residential neighborhoods; Social and Rehabilitation Services
10th Street / Vermont Street	18	Downtown Lawrence; Local retail stores
7th Street / Vermont Street	81	Downtown Lawrence; Lawrence Public Library; Buford M. Watson Jr. Park

*Weekday inbound ridership (boardings and alightings) for Route 1 only.

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

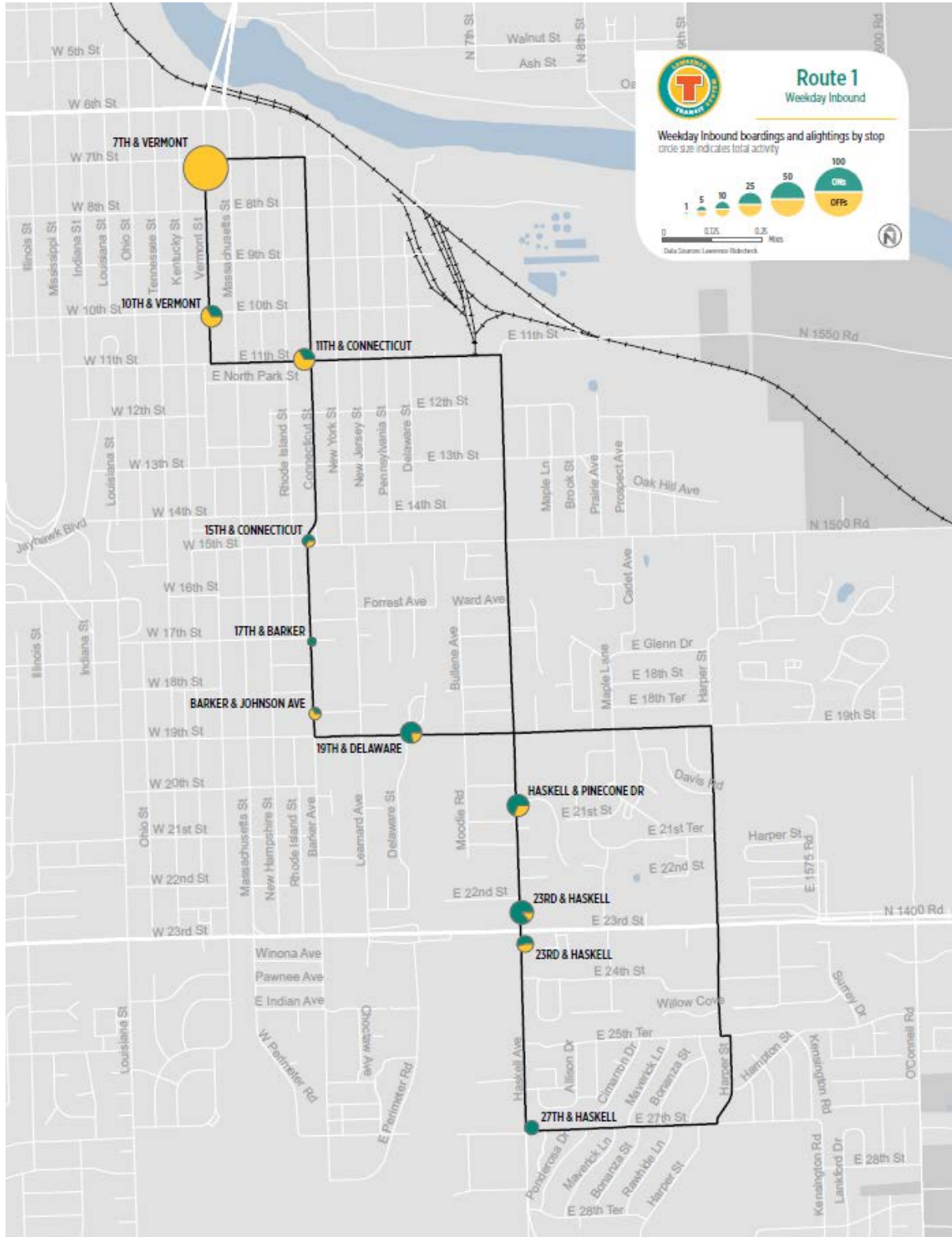
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

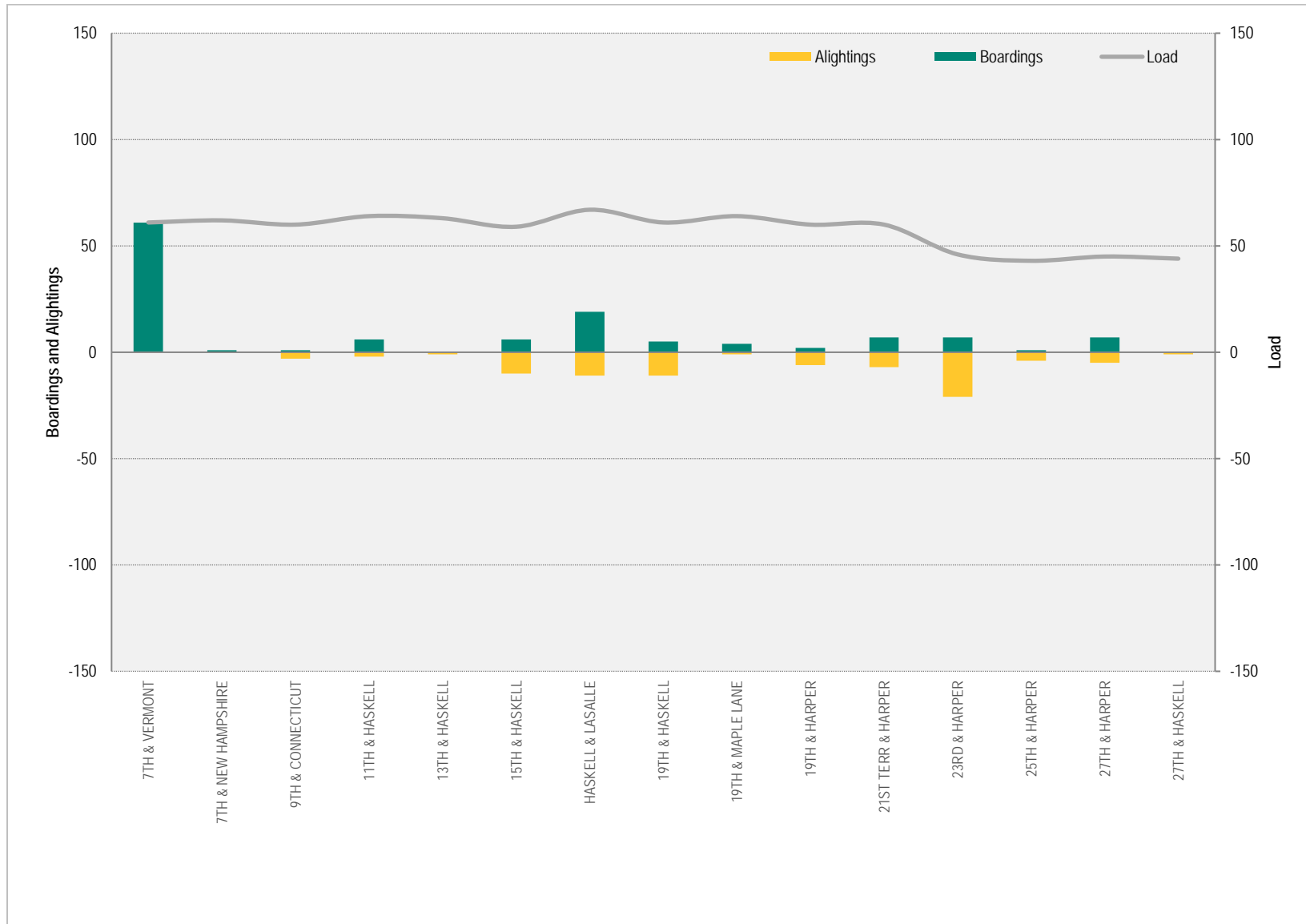
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

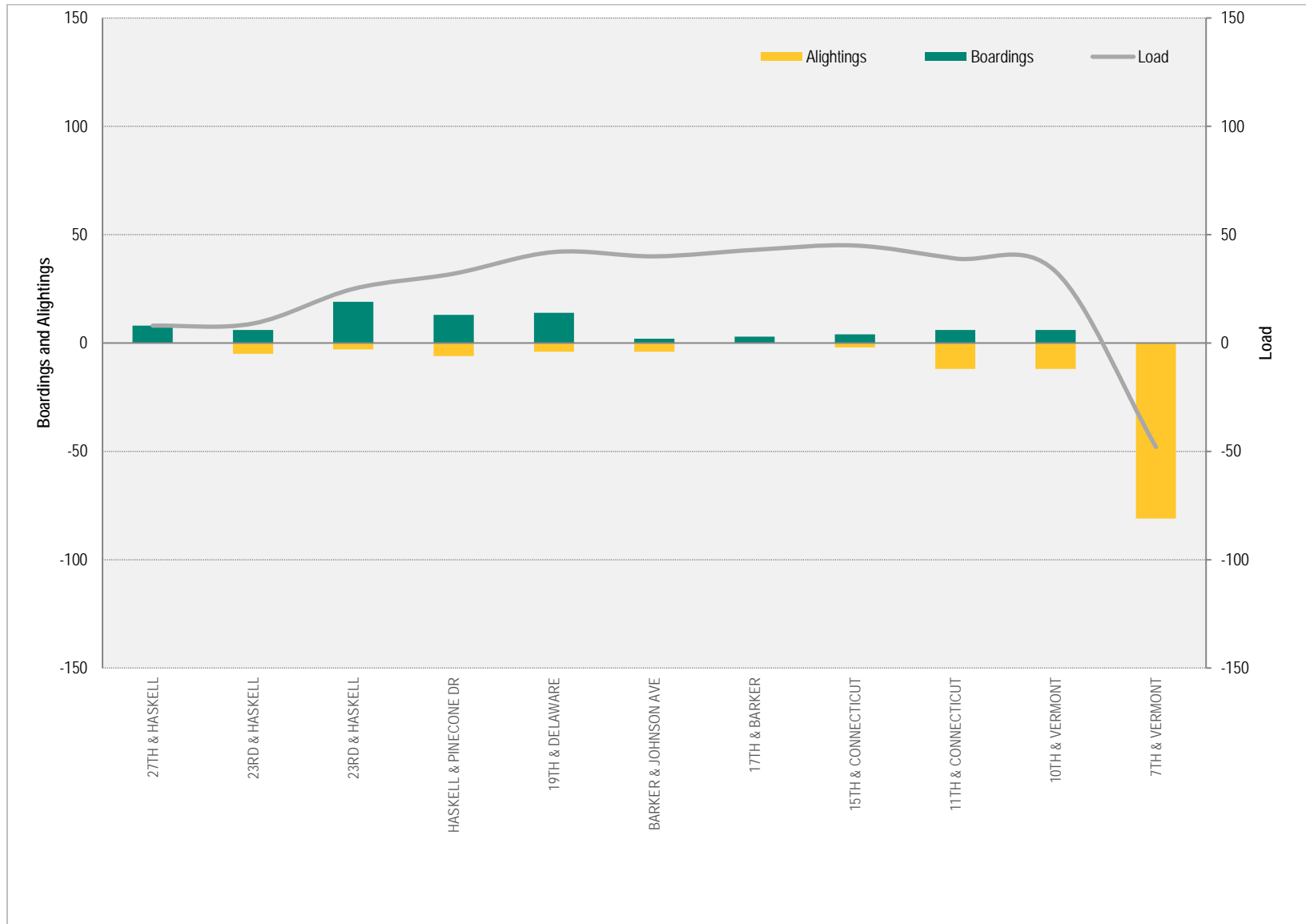
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

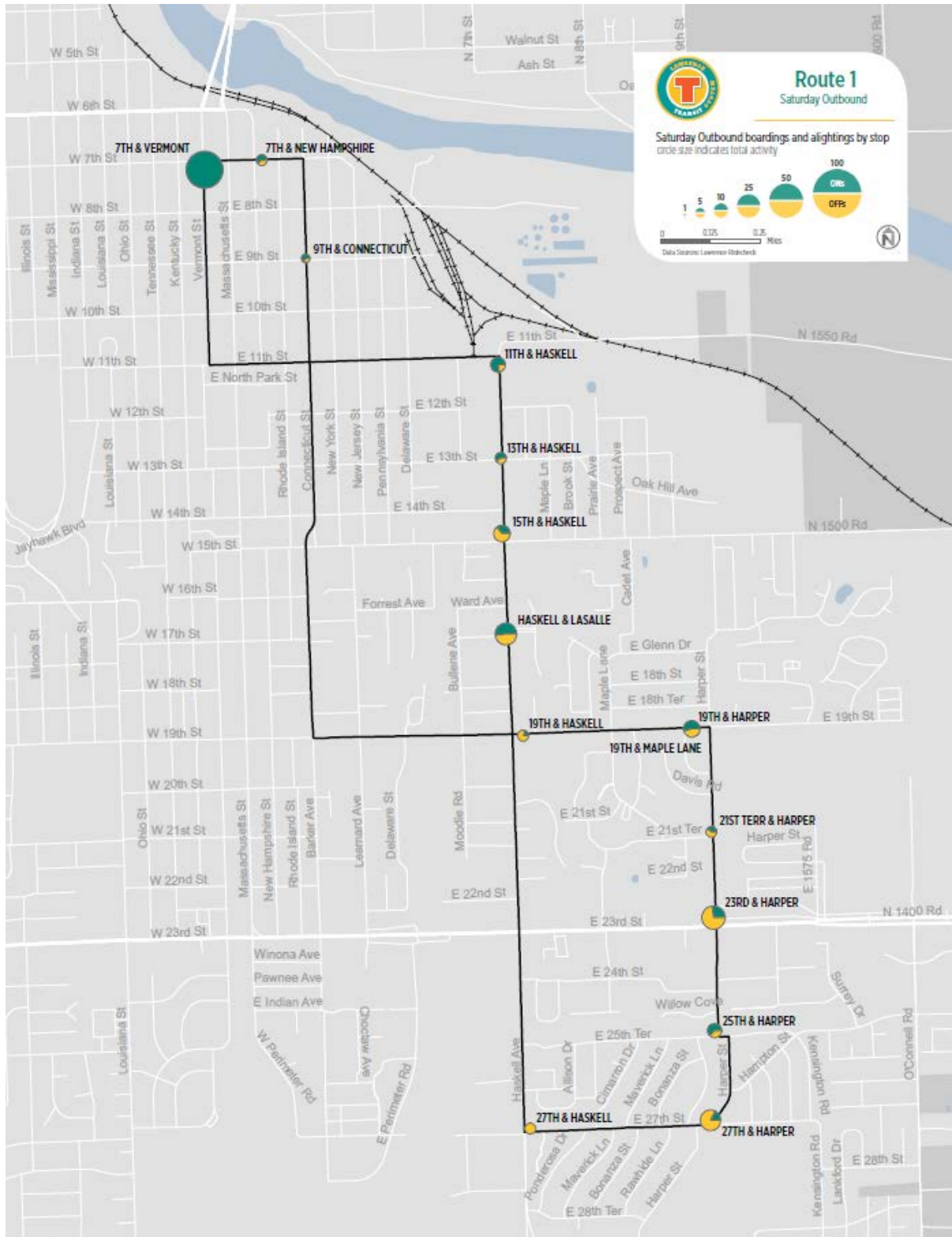
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

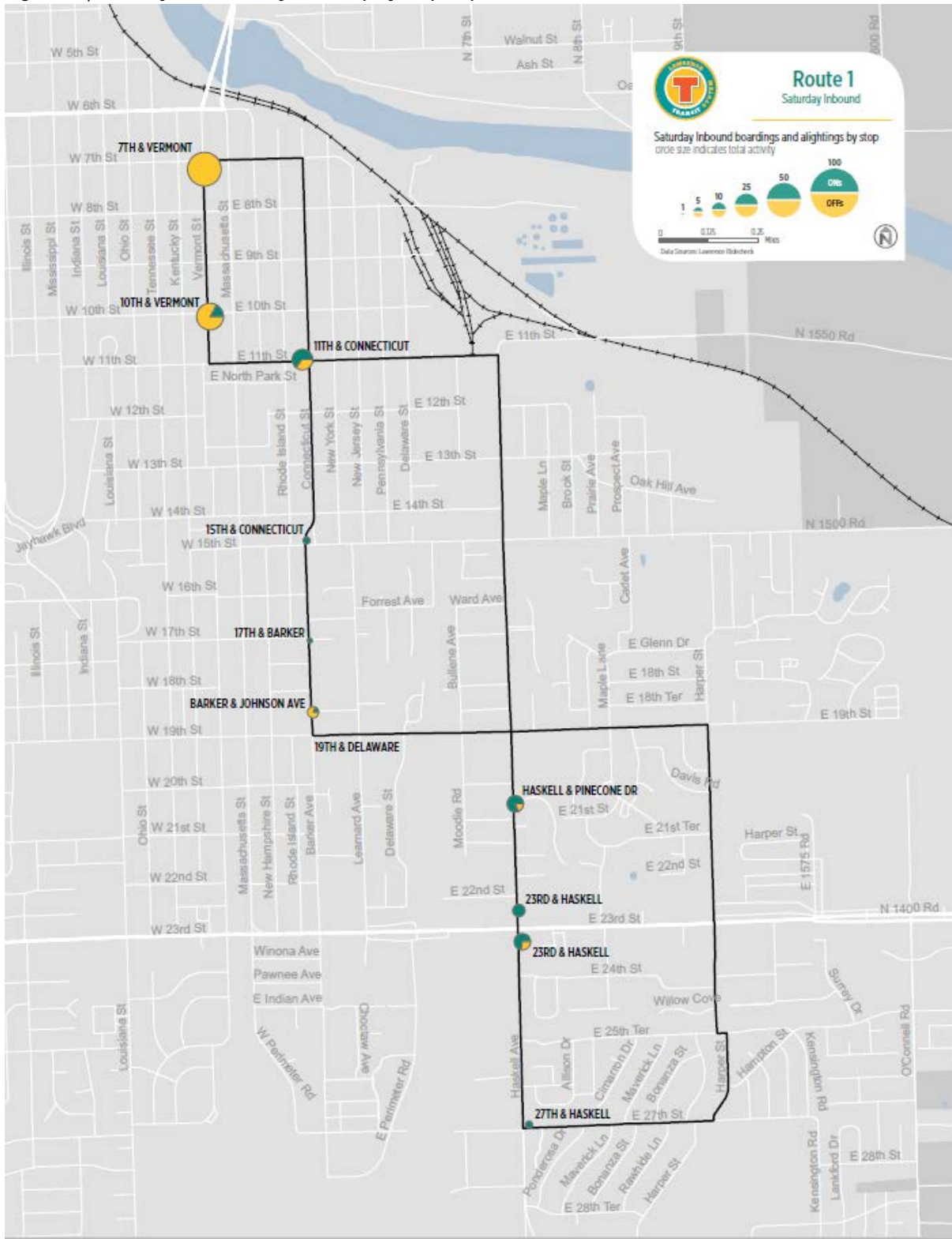
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

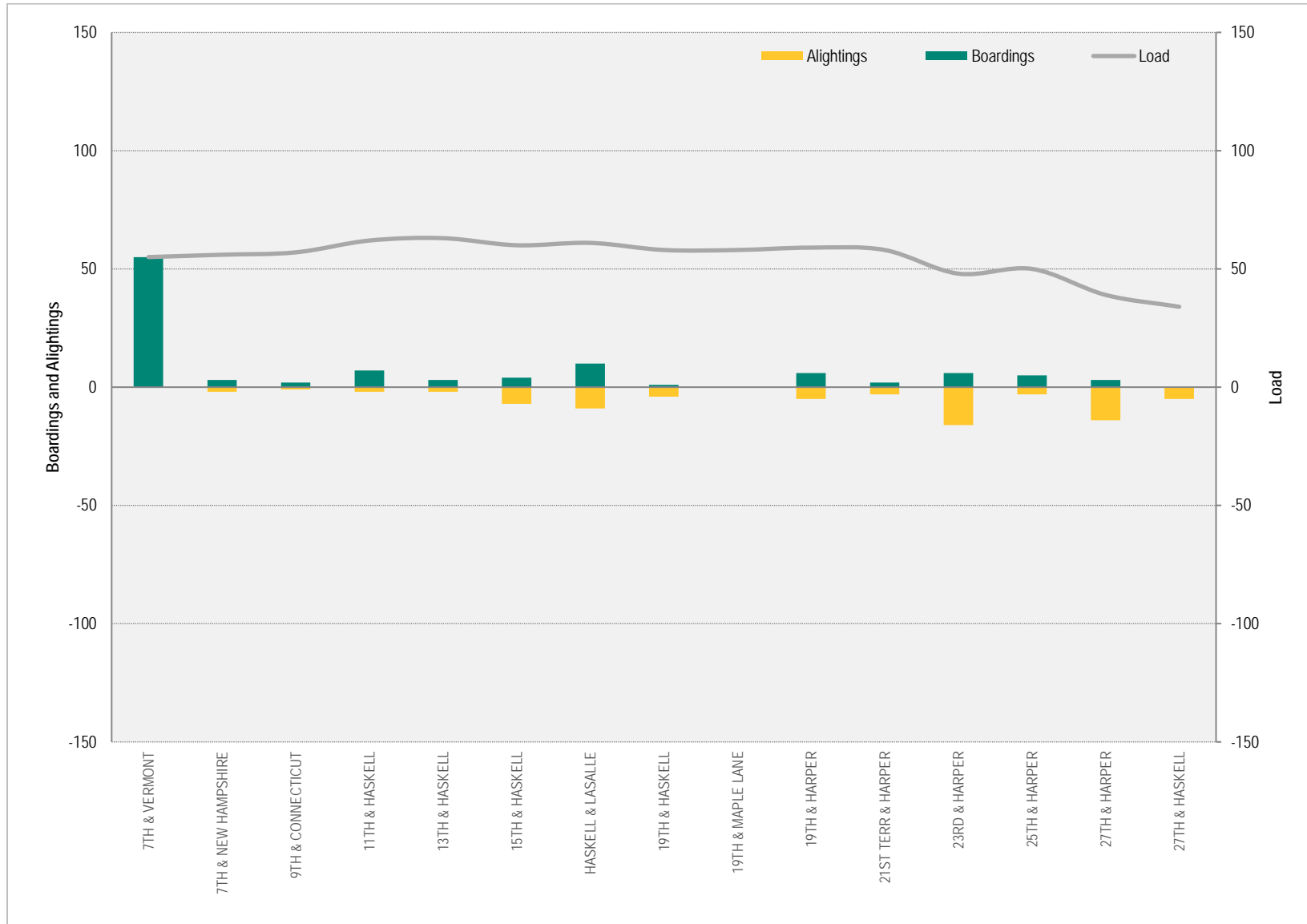
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

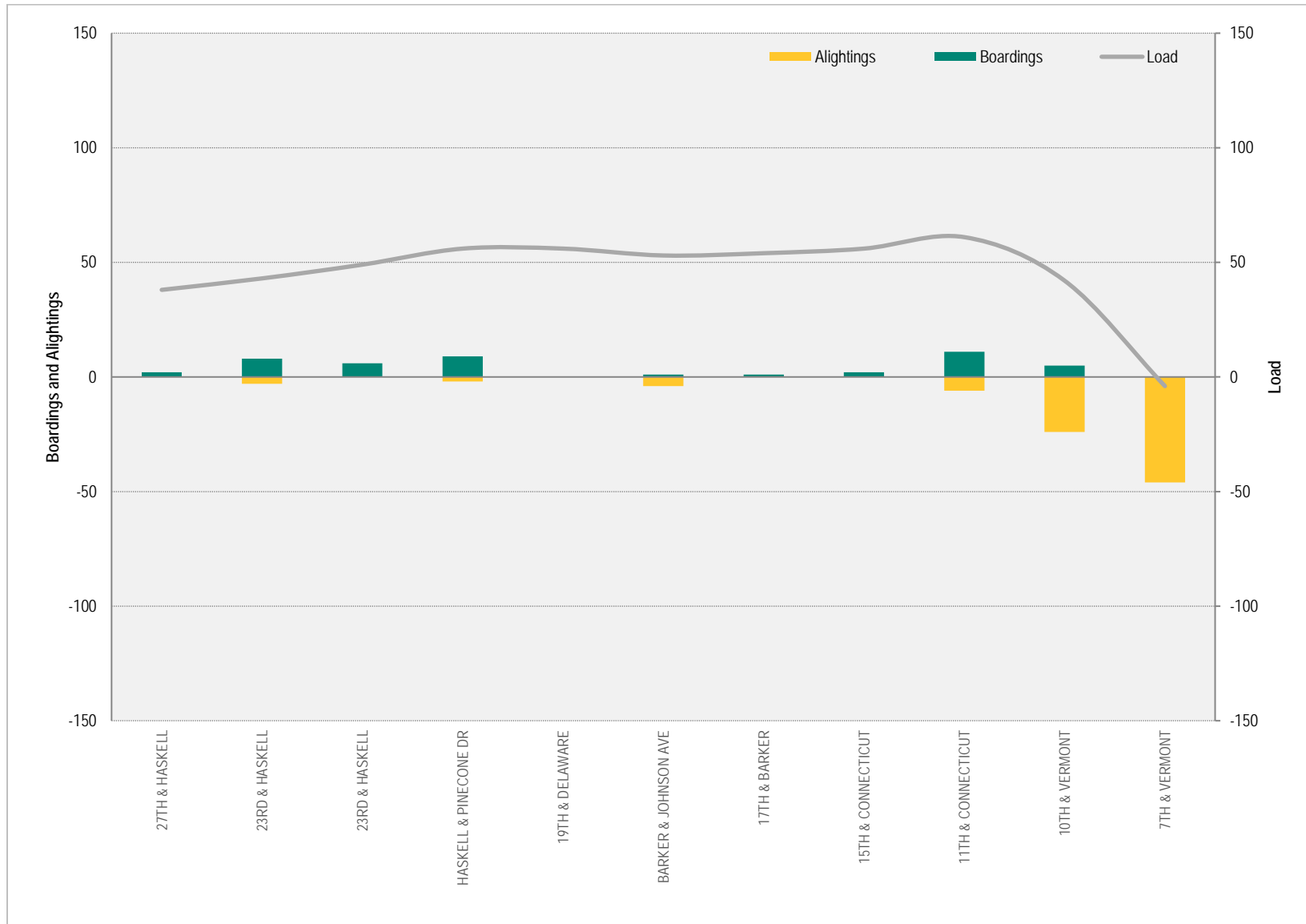
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

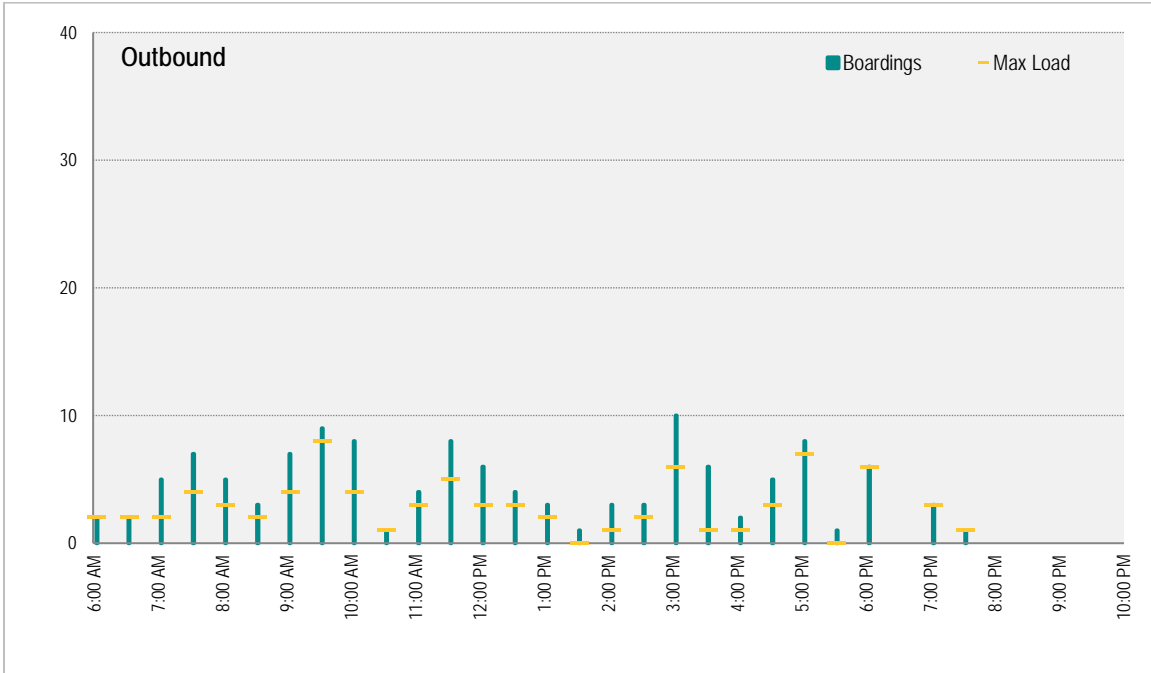
RIDERSHIP BY TRIP

Ridership by trip on Route 1 is generally low, with few trips carrying more than 10 passengers. On weekdays, Route 1 ridership on outbound service peaks at 3:00 PM, and is relatively high from 9:00 AM to 12:00 PM and 5:00 PM to 6:00 PM. Inbound ridership peaks at 7:19 AM and features minor periodic spikes in ridership between 1:00 and 7:00 PM (Figure 18 and Figure 19).

On Saturdays, Route 1 ridership is highest outbound between 1:30 and 2:00 PM. Saturday inbound ridership is highest between 1:00 and 3:30 PM; no Saturday inbound trips carry more than 10 passengers (Figure 20 and Figure 21).

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

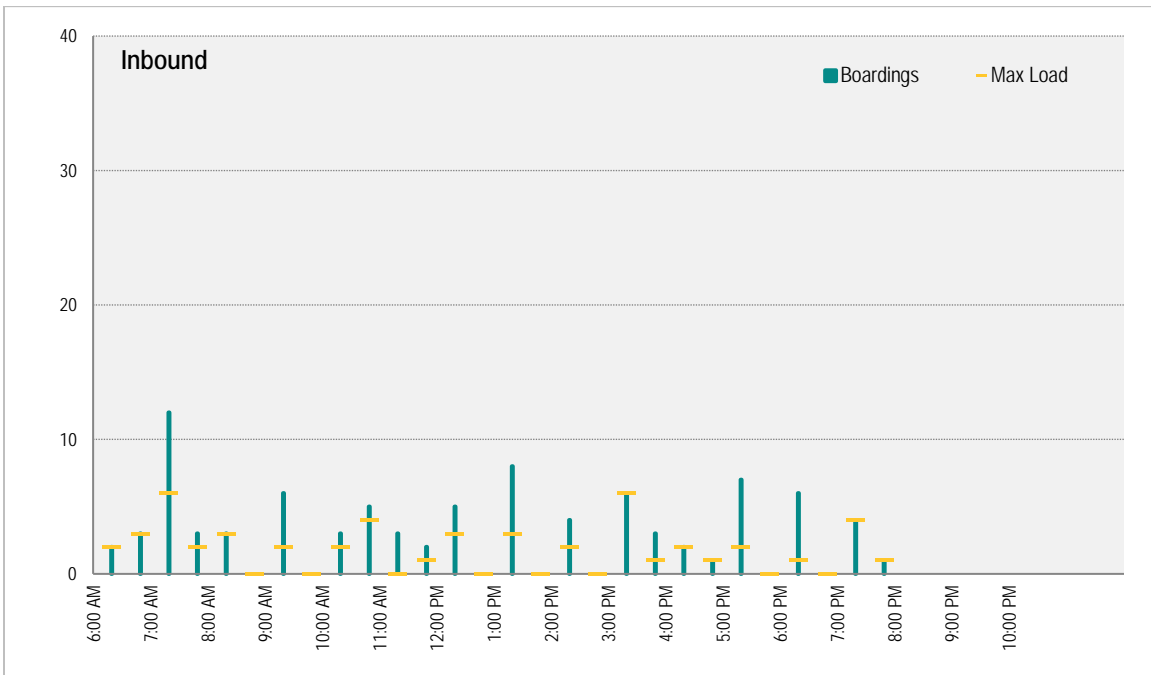
Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart

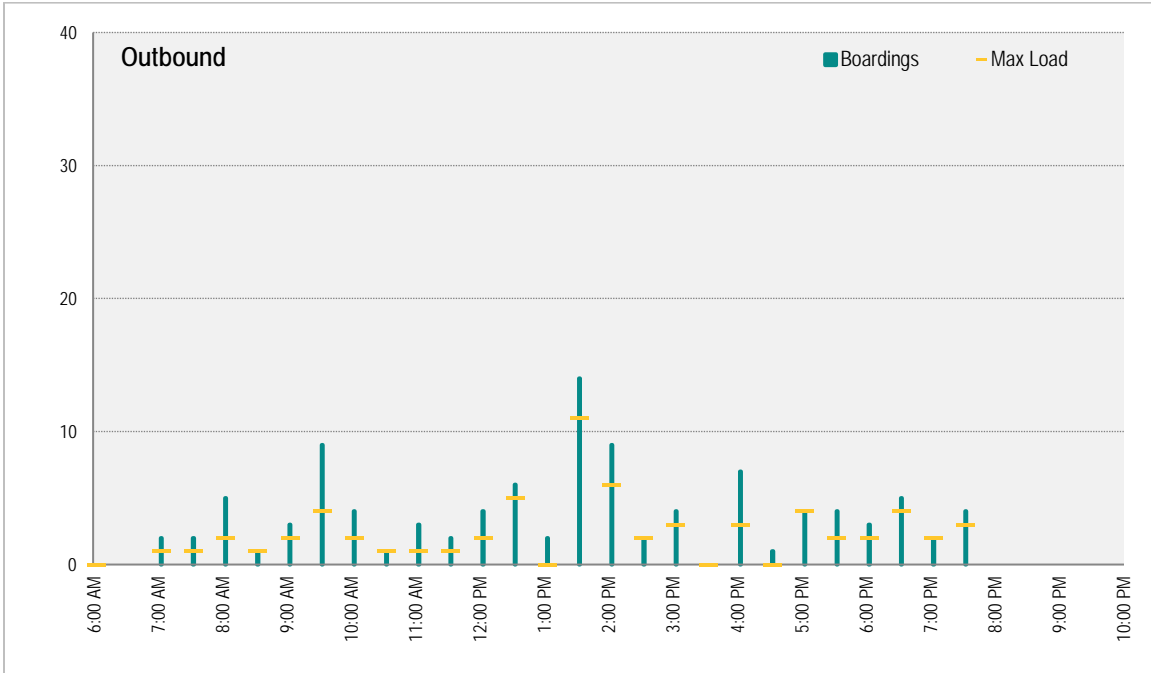


Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

ROUTE EVALUATION | ROUTE 1
Lawrence Transit

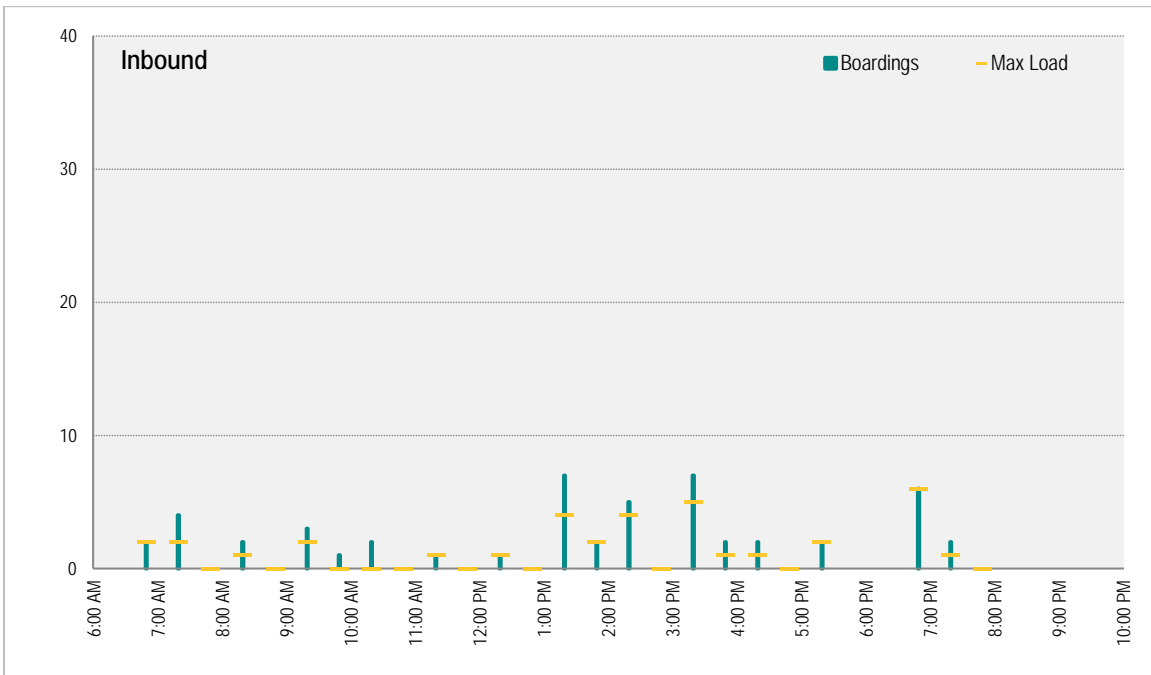
Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 6:33 AM outbound trip.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 6:19 AM inbound trip.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

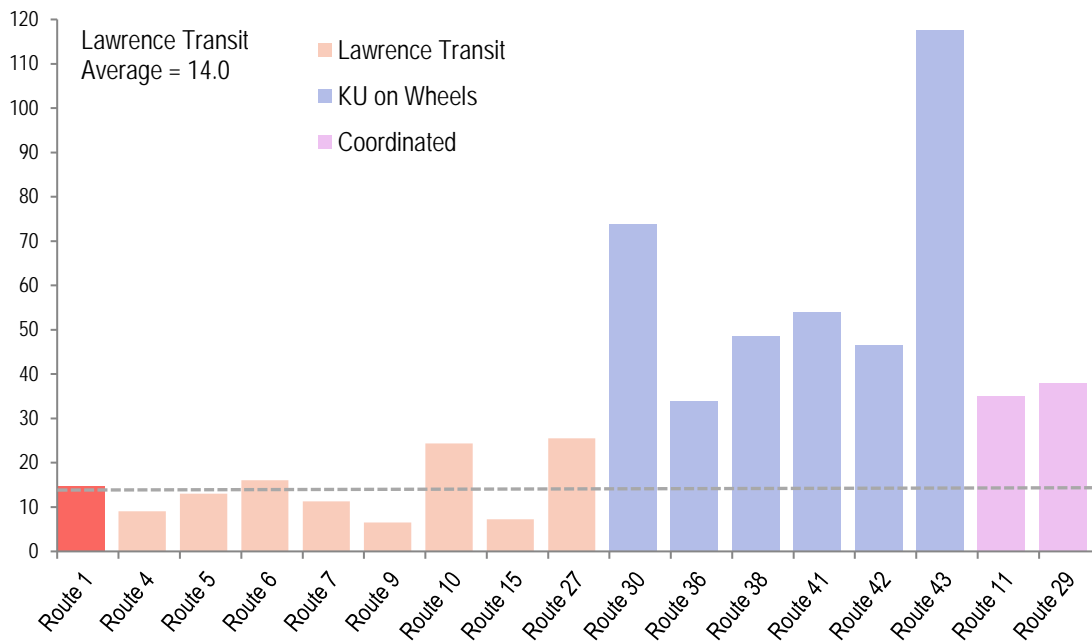
In terms of average passengers per hour, Route 1 is the fourth most productive Lawrence Transit bus route (Figure 22). The route carries 14.7 passengers per hour on weekdays, exceeding the system average by 5% (Figure 23). Route 1 carries 10.6 passengers per hour on Saturdays (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	205	13.9	14.7	14.0	4 of 9
Saturday	148	14.0	10.6	9.7	4 of 8

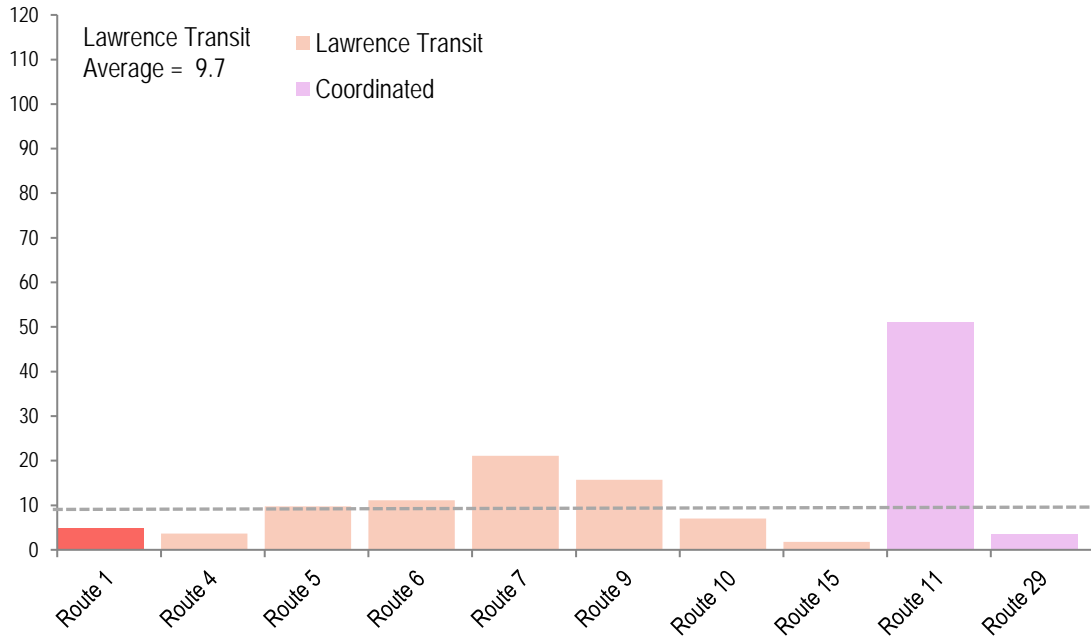
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 67% of Route 1 time points were served “on-time” during the survey period (Figure 25). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule. On Saturdays, approximately 75% of Route 1 time points were served “on-time” during the survey period.

Weekday on-time performance was affected by a high rate of late departures, with nearly 22% of time points served later than scheduled. On both weekdays and Saturdays, 11% of time points are served early, with buses departing before their scheduled departure time.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	66.9%	75.4%
Early	11.5%	11.1%
Late	21.5%	13.5%

Note: Trip data does not include all time points per trip.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 1 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route. Route 1 serves as a coverage route for the eastern half of Lawrence, with three connected loops serving mostly residential areas. As a coverage route, Route 1 serves a general purpose with no clear commute pattern, and its performance remains average or below average across most measures.

- **Remove one-way loops.** Most ridership on Route 1 occurs in downtown along Vermont Street, and along Haskell Avenue and Harper Street. One-way loops tend to make service less useful to riders, and less effective overall, because trips are only convenient in one direction. To simplify Route 1, service can be provided bi-directionally along one of its current directional alignments.

As of August 1st, 2016, Route 1 serves the Lawrence Community Shelter and no longer has the two large southern loops outside of downtown. The route now steps through eastern Lawrence, providing two-way service along 11th Street, Haskell Avenue, 19th Street, Harper Street, and 23rd Street between downtown and the Lawrence Community Shelter.

- **Reduce redundancy.** Route 1 has significant overlap with Route 15, with both routes operating outbound along Connecticut Street and Haskell Avenue, and inbound along Barker Avenue and Vermont Street. Splitting this alignment, so that one route operates bi-directionally along one set of streets and the other operates bi-directionally along the other set of streets will simplify both routes, reduce redundancy, and make transit service more appealing to riders along corridors that are currently served in one direction only.

The recent changes to Route 1 has reduced redundancy with Route 15, with each route now operating bi-directionally along a unique set of streets.

- **Begin Service at 7:03 AM; End Service after the 7:33 PM Departure.** Service on Route 1 currently begins at 6:03 AM and ends at 7:59 PM (last departure at 7:49 PM). Low ridership on departures before 7:00 AM and after 7:33 PM indicate that the resources necessary to operate that service could be better spent elsewhere. As a result, reducing the service span to approximately 7:00 AM to 7:30 PM would benefit users in some other way or on some other part of the system.
- **Operate Saturday Service Every 60 Minutes.** Trips on Route 1 on Saturday rarely have more than 10 passengers onboard. Offering service every 60 minutes instead of every 30 would save resources and allow for improvements on other aspects of the system.

Lawrence Transit System

ROUTE 4

North Lawrence to 9th and Iowa

SERVICE DESIGN

Route 4 is a Lawrence Transit route that operates between North Lawrence and the Hillcrest Shopping Center. The route travels primarily along 2nd Street, Vermont Street, and 9th Street (Figure 1). Route 4 provides service to the I-70 Business Park, downtown Lawrence, and the Hillcrest Shopping Center.

ALIGNMENT/SERVICE PATTERNS

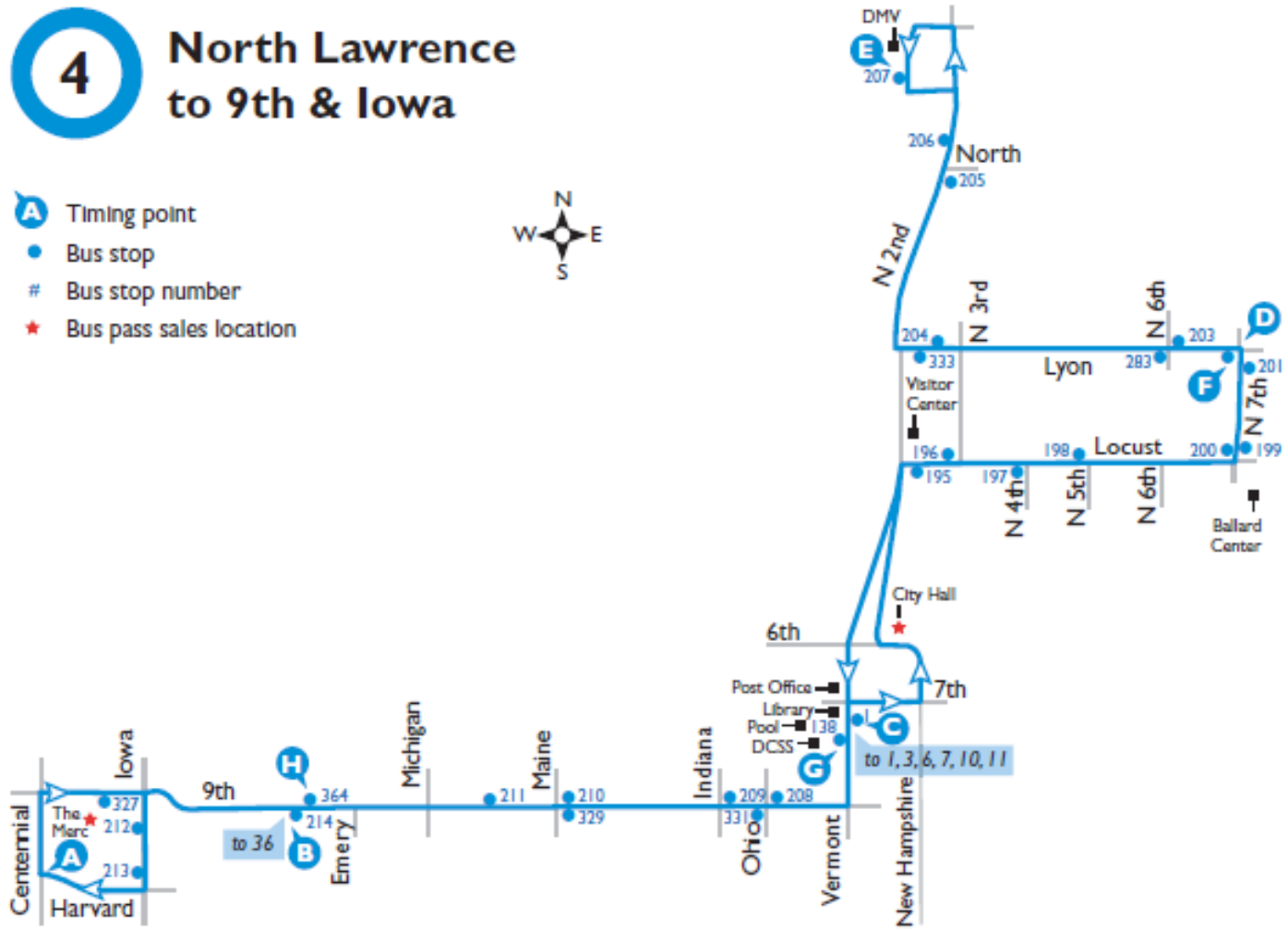
Route 4 has one primary service pattern for weekday and Saturday service. Departing outbound from the DMV on 2nd Street in North Lawrence, Route 4 travels south on 2nd Street, turns left on Lyon Street, right on 7th Street, right on Locust Street, and left on 2nd Street, which becomes Vermont Street after crossing the Kansas River. Route 4 then continues on Vermont Street, before turning right on 9th Street, left on Iowa Street, right on Harvard Road, and terminating at the intersection of Harvard Road and Centennial Drive.

Returning inbound from Harvard Road and Centennial Drive, Route 4 turns right on Centennial Drive, right on 9th Street, left on Vermont Street, right on 7th Street, and then left on New Hampshire Street, a right on 6th Street, and a right on Massachusetts Street, which becomes 2nd Street after crossing the Kansas River. After crossing the river, Route 4 continues along the inbound alignment to reach the terminus at the DMV on 2nd Street.

On weekdays and Saturdays, the first inbound trip begins near the intersection of 7th Street and Vermont Street in downtown Lawrence, rather than at the DMV, and then continues towards Harvard Road and Centennial Drive along the regular alignment.

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

Figure 1 | Route Map



Source: Lawrence Transit: August 2015 - September 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 4 and several Lawrence Transit routes at the downtown transit hub. There are also transfer opportunities at several other points along the route, including along 9th Street (Route 36) (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Downtown Transit Hub	Route 1, Route 3, Route 6, Route 7, Route 10, Route 11, Route 15
University Terrace Apartments (9th Street)	Route 36

SERVICE SCHEDULE

Route 4 operates service Monday-Saturday year round (Figure 3). On weekdays and Saturdays, the route runs every 60 minutes from 6:03 AM to 7:45 PM. Route 4 does not operate on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:03 AM to 7:45 PM	60	14/14
Saturday	6:03 AM to 7:45 PM	60	14/14
Sunday	No service	—	—

Source: Lawrence Transit

RIDERSHIP

Route 4 ranks seventh of nine Lawrence Transit routes in terms of weekday ridership and sixth of nine in terms of ridership per trip (Figure 4). On average, the route carries 124 passengers, or 4.4 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 4 carries 85 passengers, or 3.0 per trip.

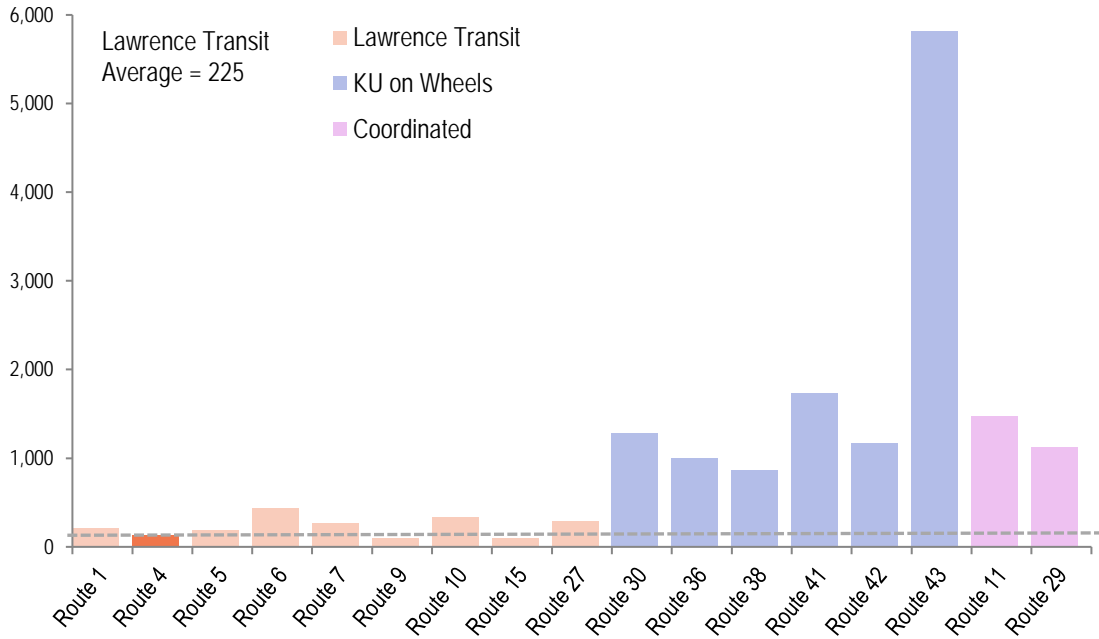
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	124	28	4.4	6.5	6 of 9
Saturday	85	28	3.0	4.7	6 of 8

Source: Lawrence Transit, 2016

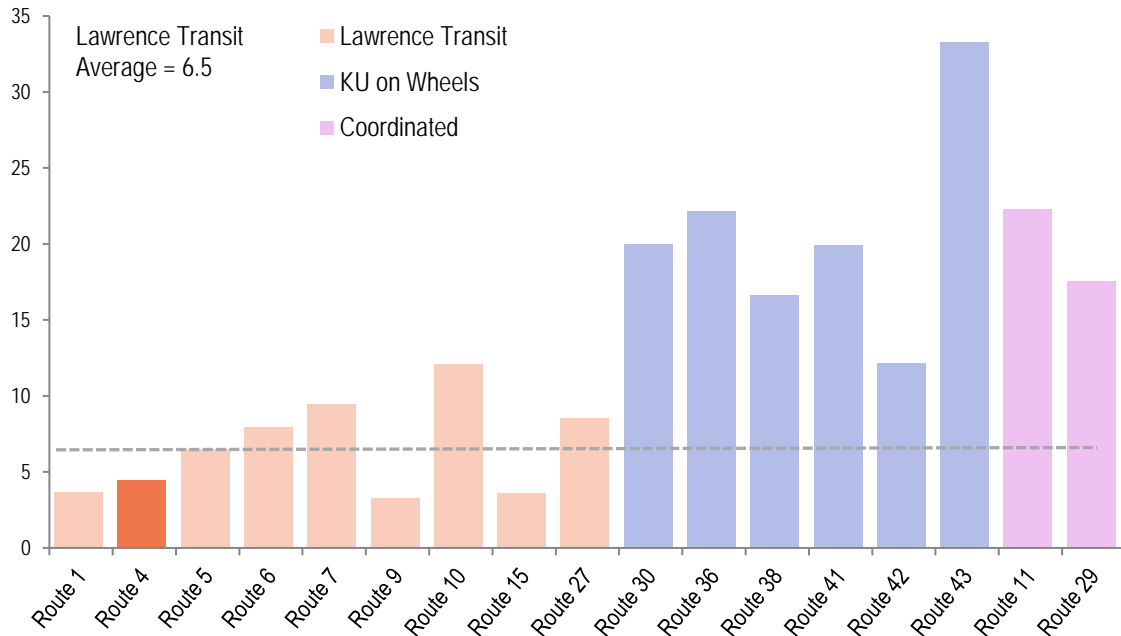
ROUTE EVALUATION | ROUTE 4
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

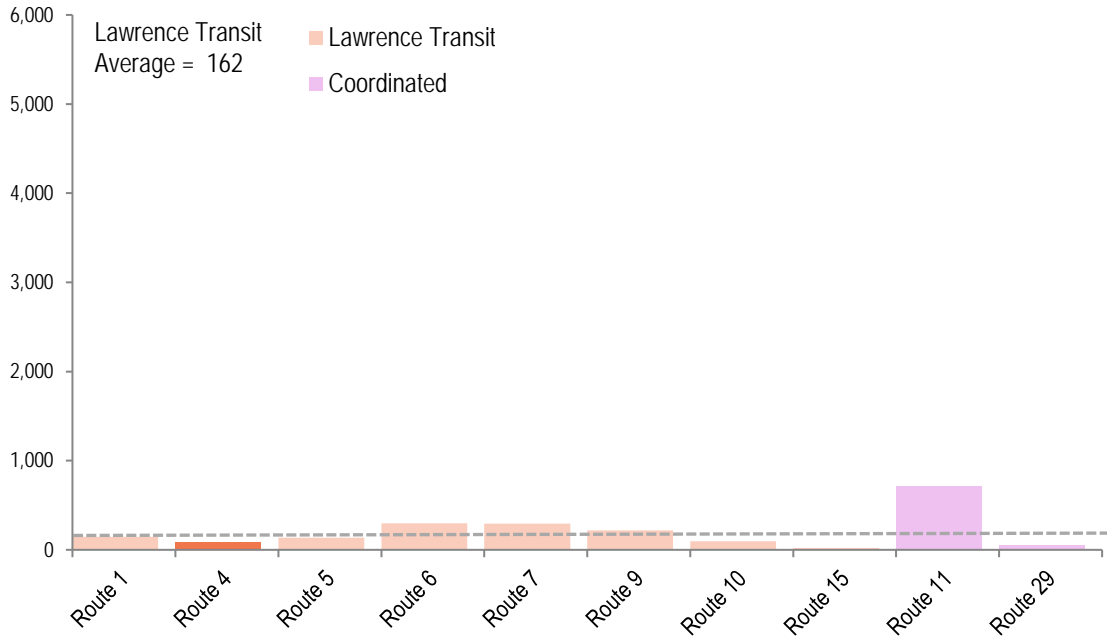
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

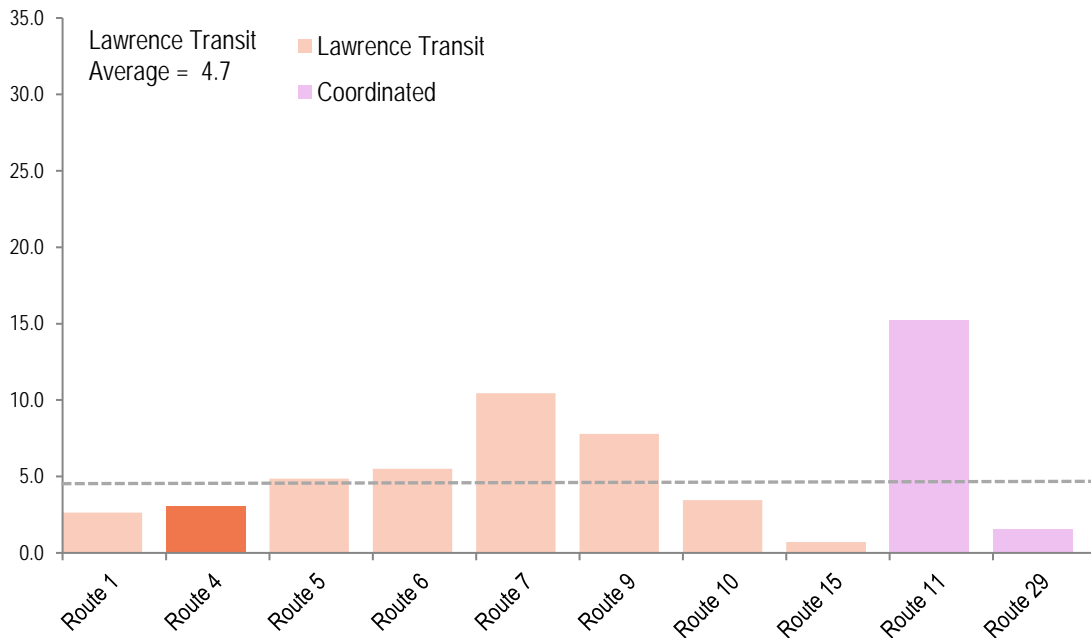
ROUTE EVALUATION | ROUTE 4
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

For weekday inbound service, the highest ridership stops on Route 4 are located in downtown Lawrence and at the I-70 Business Center. Ridership generated at these destinations ranges from 50 to 66 daily passengers. Other stops with more than 10 boardings and alightings per weekday include: 9th Street and University Terrace and 4th Street and Locust (Figure 9). These stops serve a mix of residential neighborhoods and retail destinations. All other stops serve fewer than eight combined boardings and alightings (Figure 10-Figure 13).

Traveling outbound, weekday ridership is highest in downtown Lawrence and in North Lawrence. Two stops generate more than 20 combined daily boardings and alightings: Visitor’s Center (23 passengers) and 8th Street and Vermont Street (22 passengers).

Saturday ridership patterns closely resemble weekday patterns, but feature significantly lower ridership volumes (Figure 14-Figure 17). Only two stops generate more than 10 combined boardings and alightings on Saturdays: 7th Street and Vermont Street and 8th Street and Vermont Street.

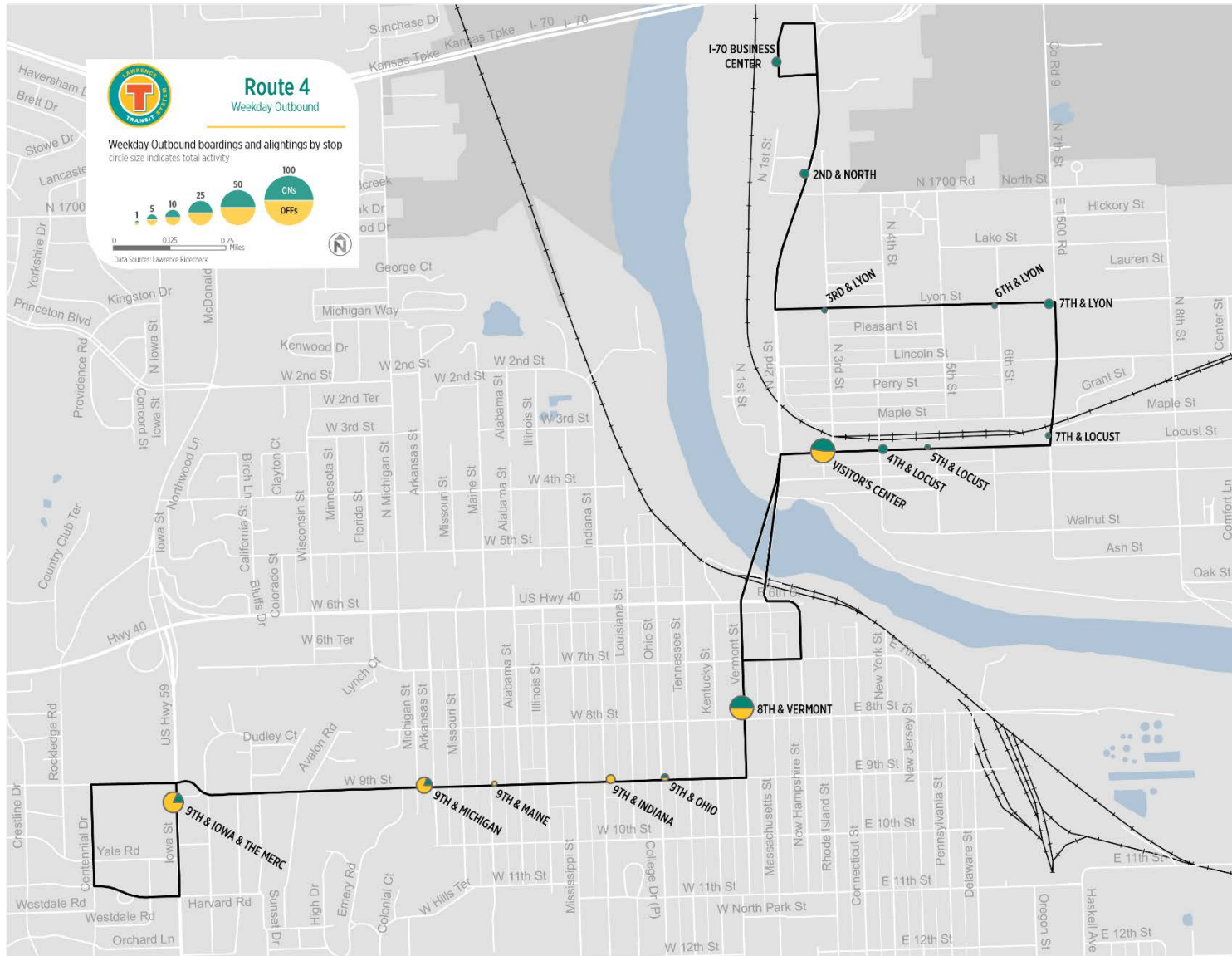
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
7th Street / Vermont Street	66	Downtown Lawrence
I-70 Business Center	50	I-70 Business Center; national retail stores
9th Street / University Terrace	19	Off-campus student housing; residential neighborhoods
4th Street / Locust Street	13	Residential neighborhoods; Union Pacific Depot
Harvard Road / Iowa Street	8	Hillcrest Shopping Center

*Weekday inbound ridership (boardings and alightings) for Route 4 only

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

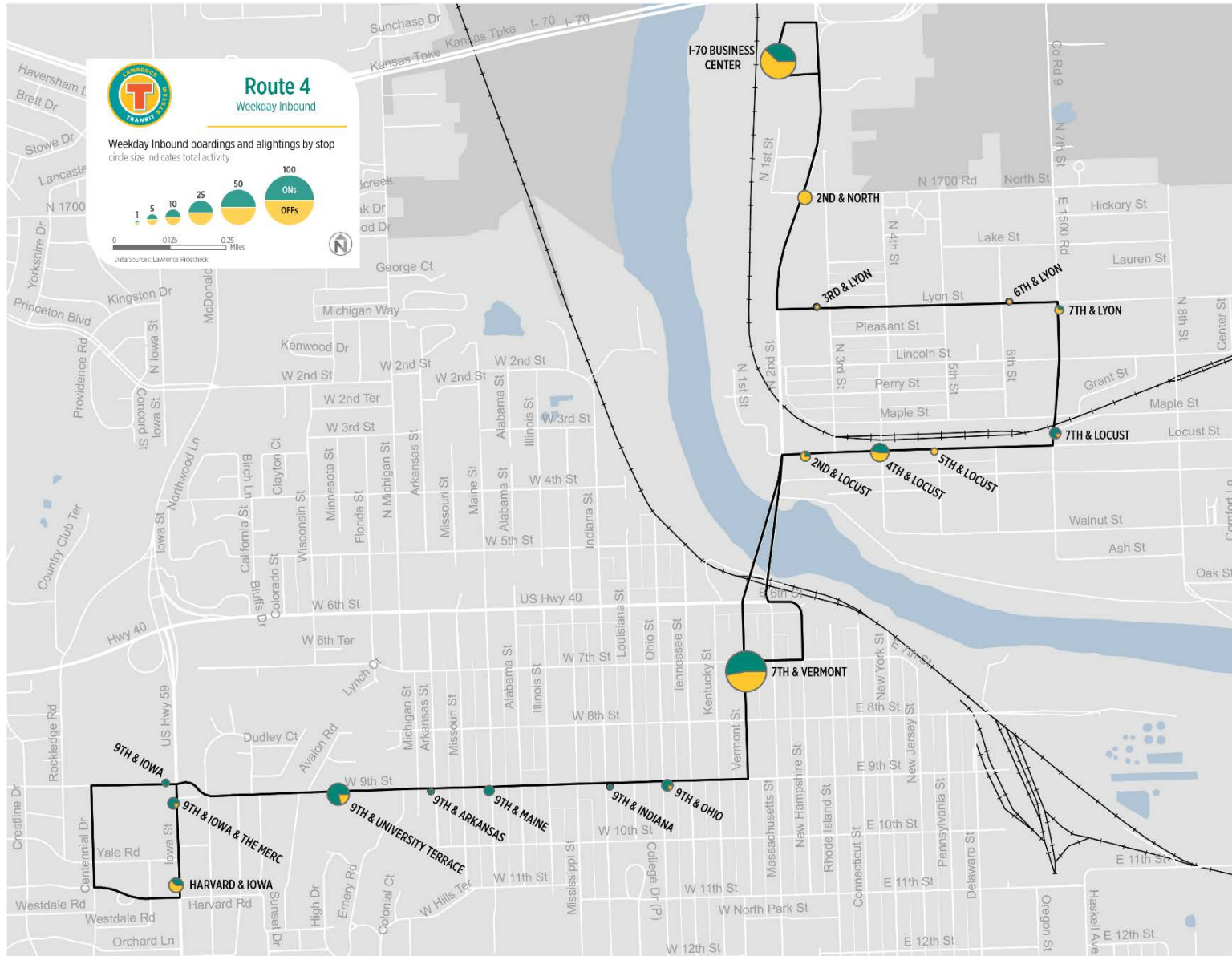
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

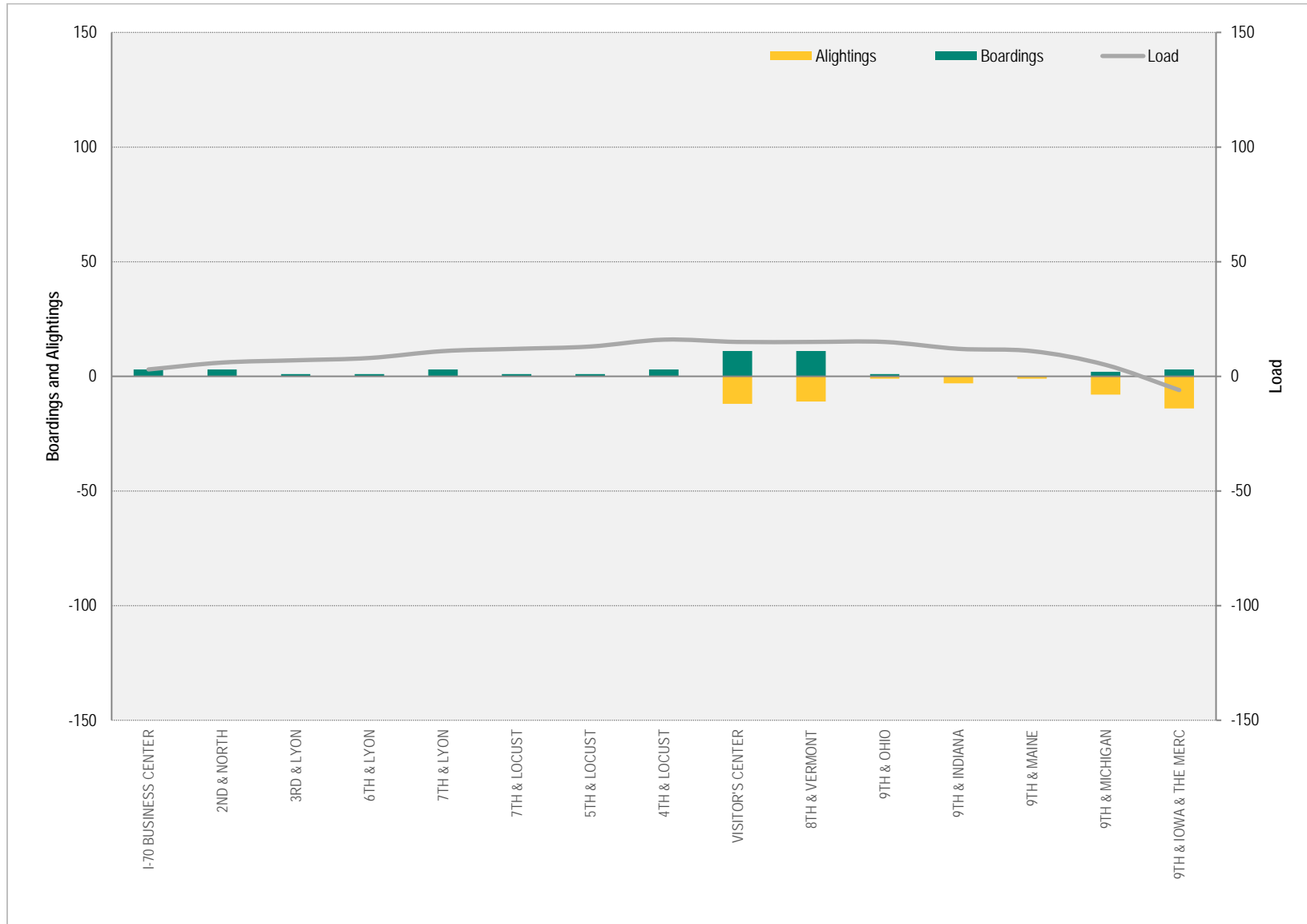
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

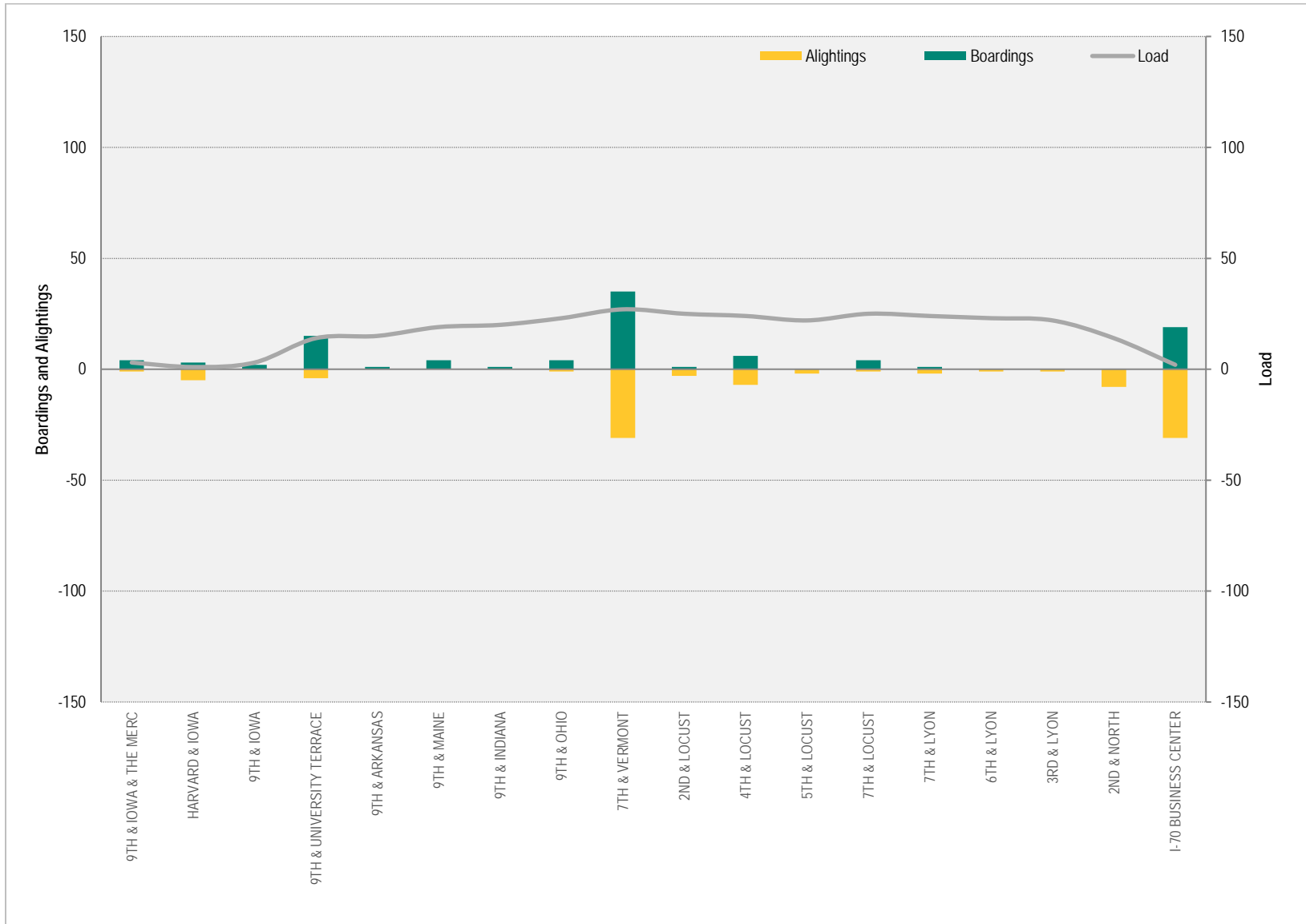
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

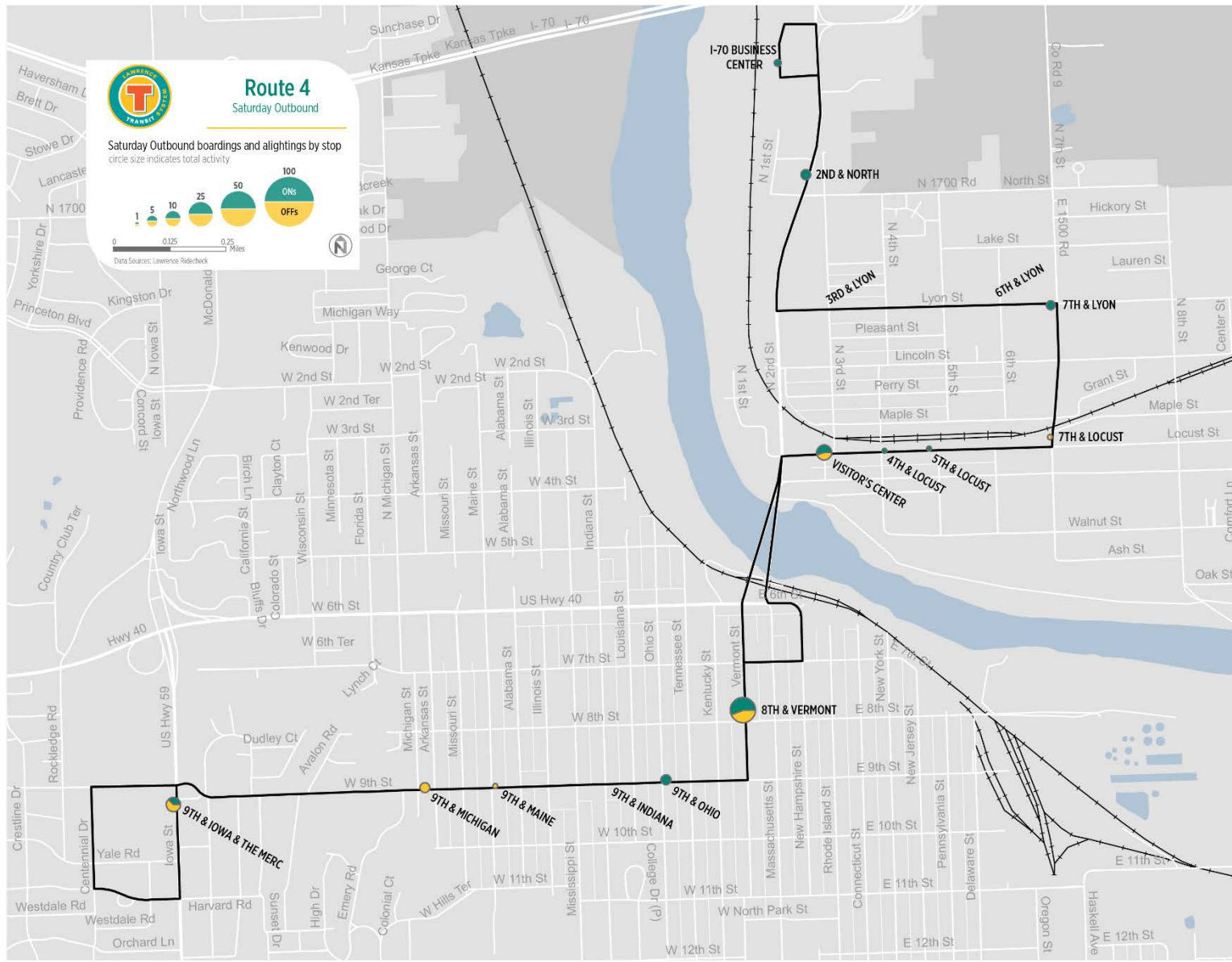
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

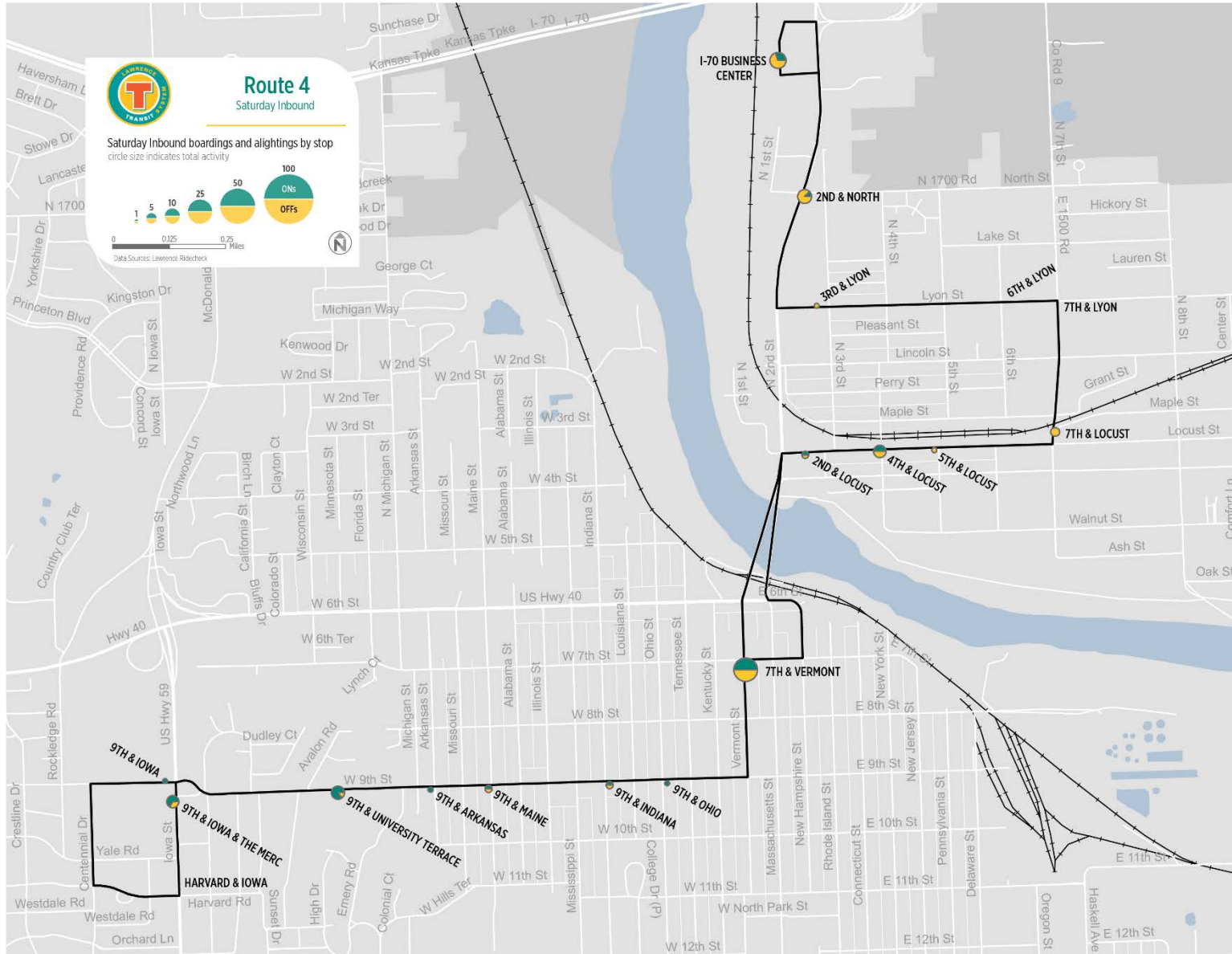
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

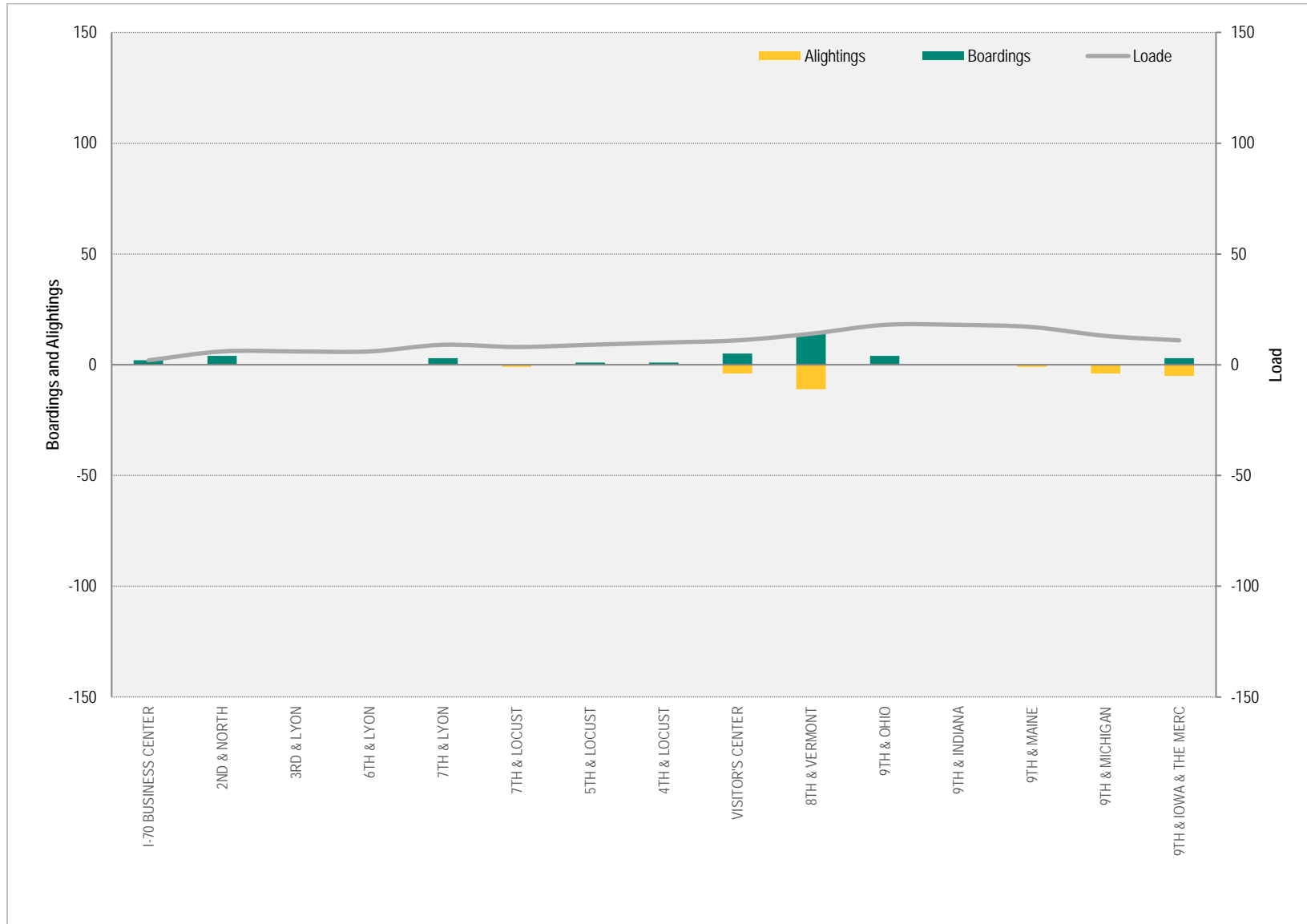
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

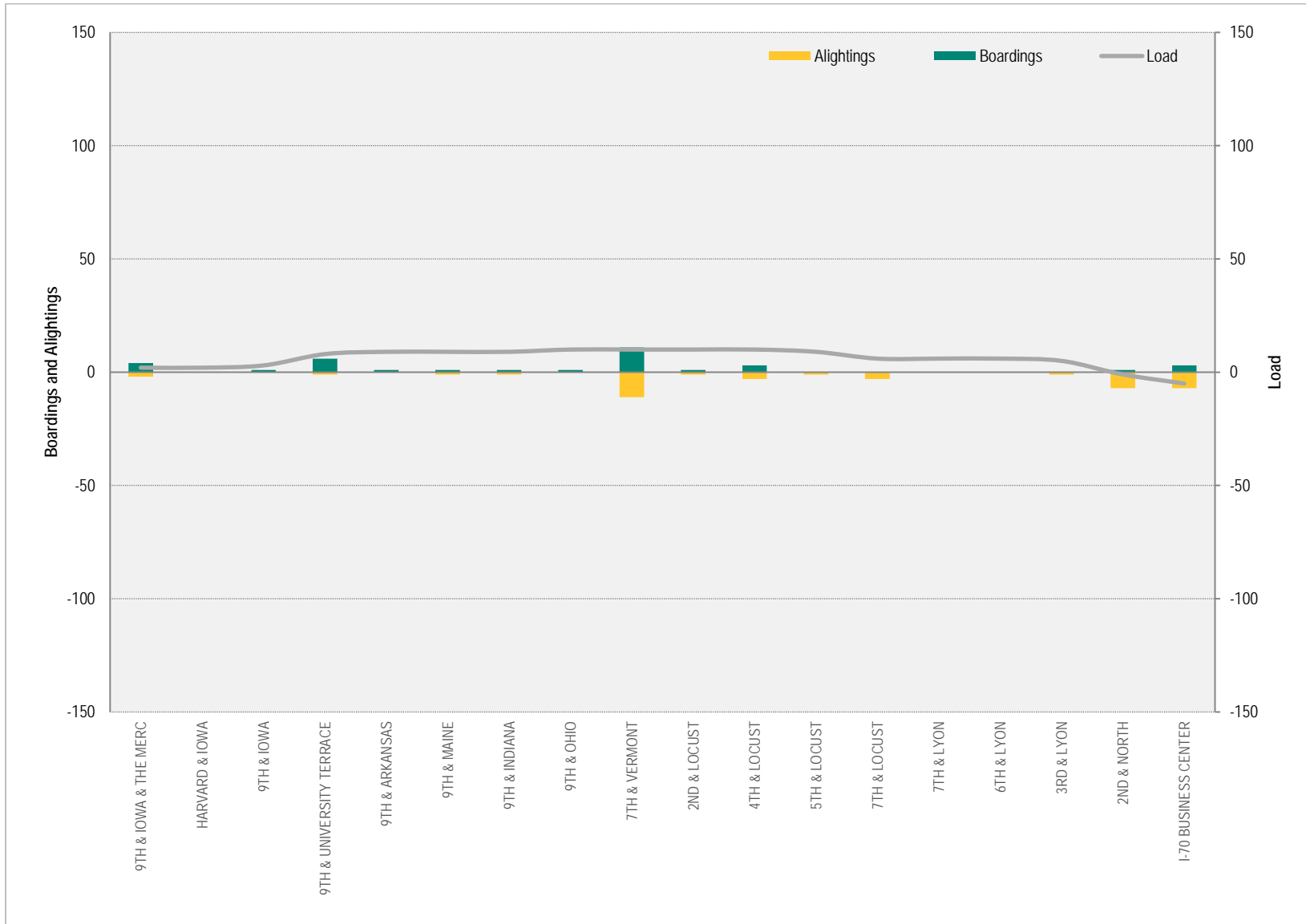
16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

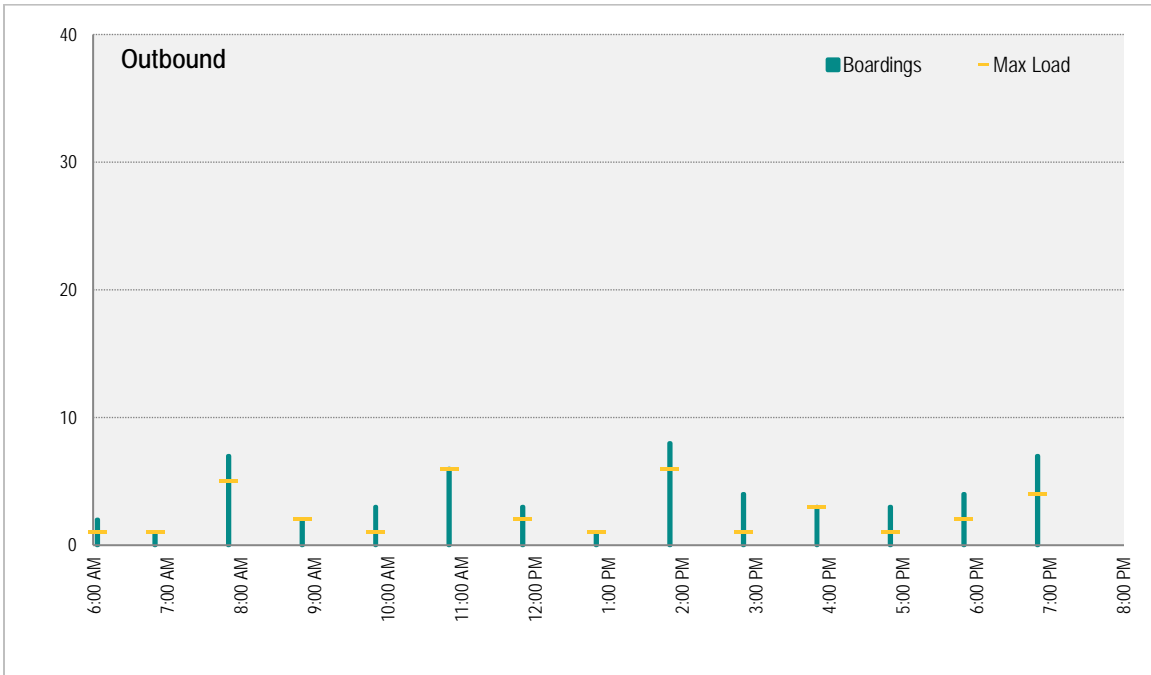
RIDERSHIP BY TRIP

On weekdays, Route 4 ridership is highest traveling in the inbound direction, recording three trips with 10 or more passengers (Figure 18). Ridership in the inbound direction peaks at 7:13 AM, at 12 passengers. A secondary peak exists between 2:00 and 4:15 PM, when two trips record 10 passengers each. Outbound ridership is inconsistent throughout the day, with no outbound trips carrying more than eight passengers (Figure 19).

On Saturdays, Route 4 ridership is highest traveling outbound at 2:50 PM, at 11 passengers. Traveling inbound, no trips carry more than seven passengers (Figure 20 and Figure 21).

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

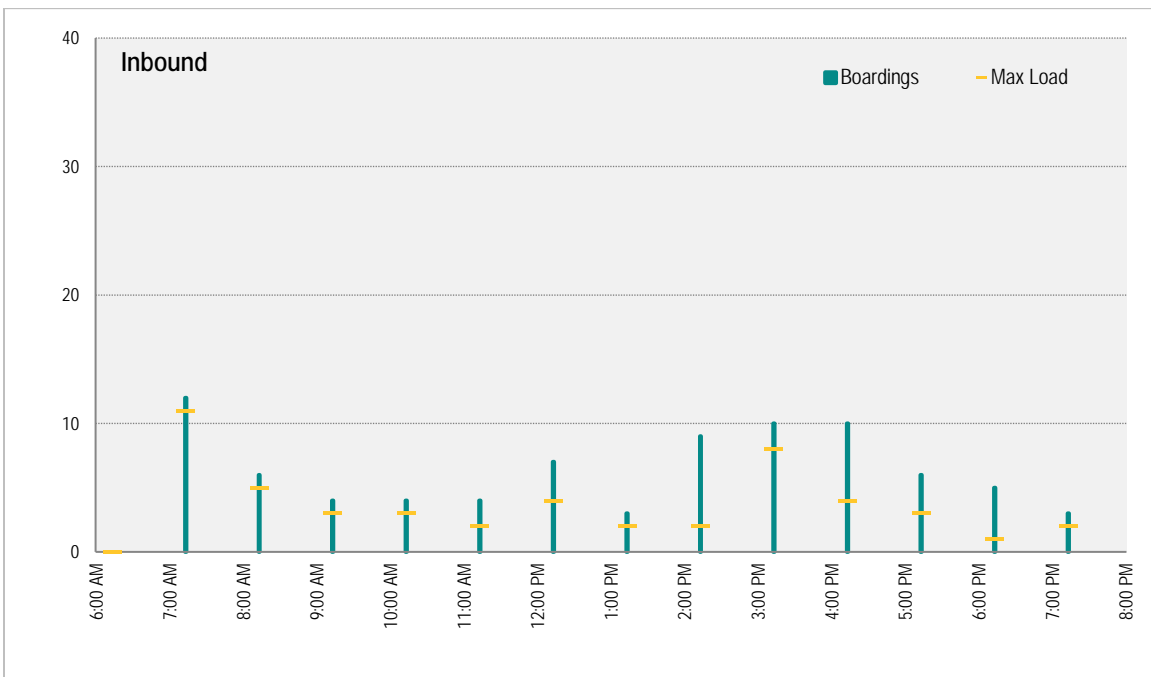
Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart

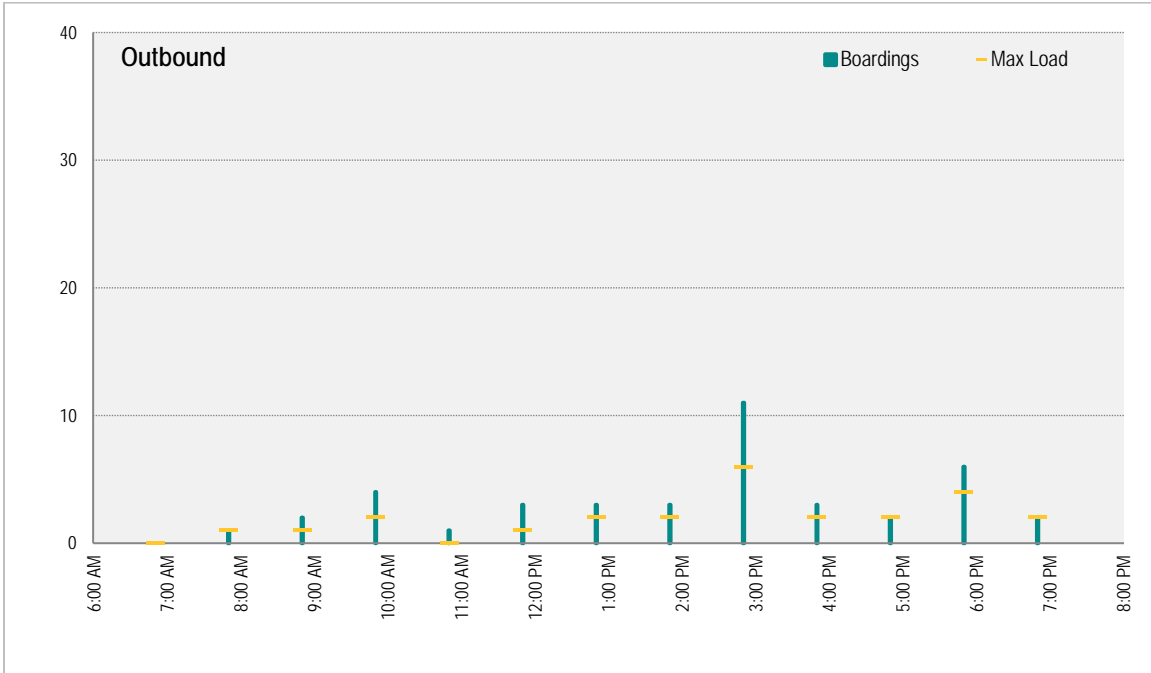


Source: Ride Check, April and May 2016.

Note: No data recorded for the 7:13 PM trip. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

ROUTE EVALUATION | ROUTE 4
Lawrence Transit

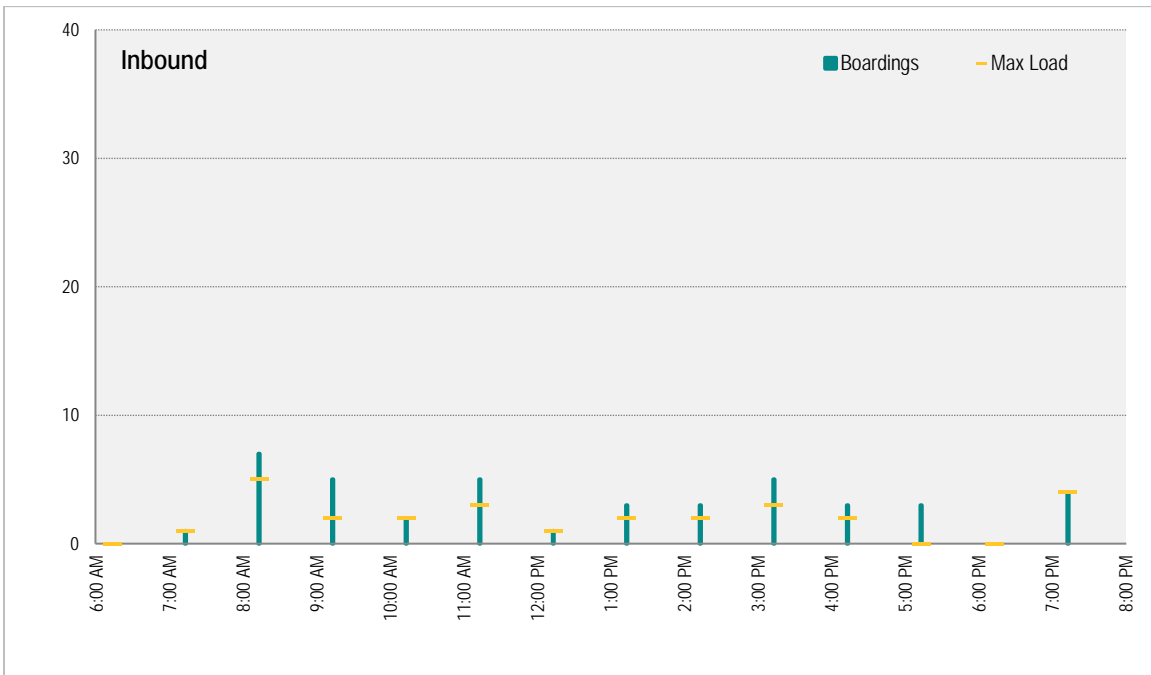
Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: No data recorded for the 6:03 AM trip. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

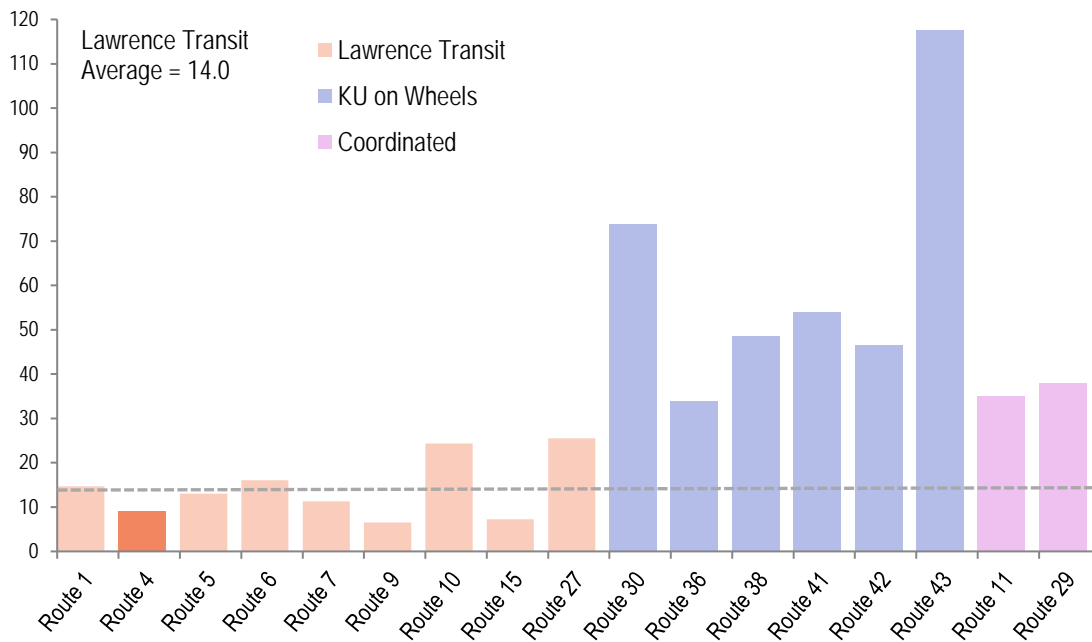
In terms of average passengers per hour, Route 4 is the seventh most productive Lawrence Transit bus route (Figure 22). The route carries 9.1 passengers per hour on weekdays, 35% less than the system average (Figure 23). Route 4 carries 6.2 passengers per hour on Saturdays (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	124	13.7	9.1	14.0	7 of 9
Saturday	85	13.7	6.2	9.7	7 of 8

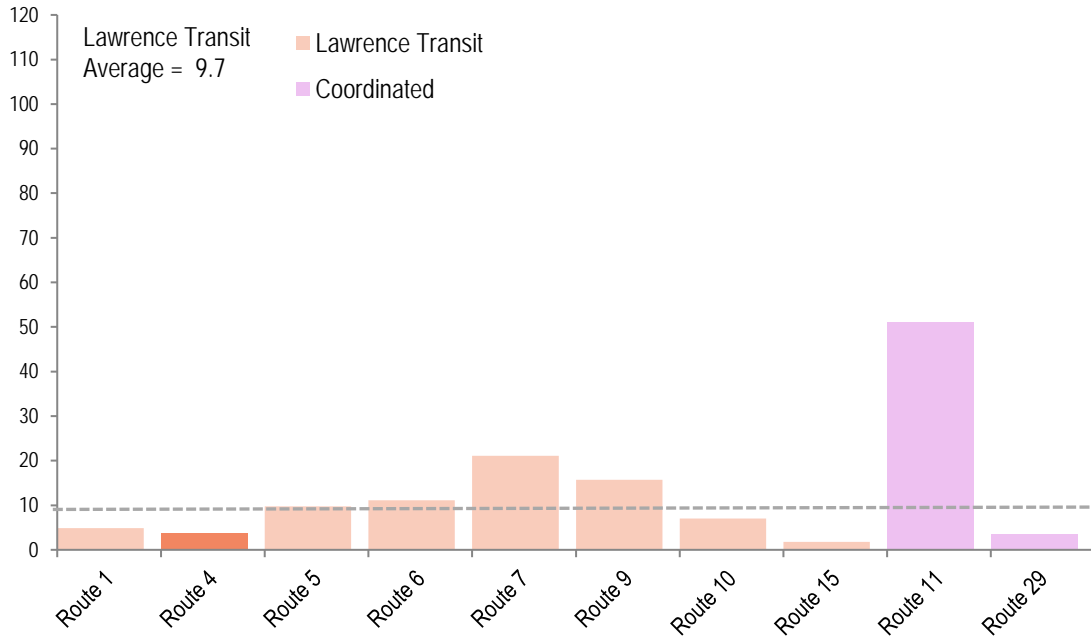
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 54% of Route 4 time points were served “on-time” during the survey period (Figure 25). On Saturdays, approximately 56% of Route 4 time points were served “on-time” during the survey period.” Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by a roughly equal number of early and late departures. Saturday on-time performance was affected primarily by early departures (about a third of all time points were served early).

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	53.8%	55.8%
Early	26.9%	32.7%
Late	19.2%	11.5%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 4 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Discontinue Service on 9th Street.** Route 4 connects North Lawrence and 9th Street to downtown but otherwise does not offer strong connections along the route to city services and other retail or employment locations. In addition, there are likely few through-riders between North Lawrence and 9th Street, as those areas are primarily residential and low-density residential/commercial, respectively. Service along 9th Street shows especially low productivity, and residents in North Lawrence have few options for shopping and making other daily trips without a car. By discontinuing service on 9th Street and reallocating those resources, better connections can be made between North Lawrence and necessary goods and services in Lawrence.
- **Discontinue Saturday Service.** Saturday service has fewer than 100 passengers per day and about 6 riders per hour in service. While maintaining a regular schedule that is similar to other routes in the system has many benefits, the productivity on Route 4 does not warrant Saturday service currently. Eliminating the route would allow for the resources to be allocated elsewhere. To maintain weekend connections to North Lawrence, a Saturday flex or similar service could be offered.
- **Improve Frequency to Every 30-Minutes.** Route 4 currently has fewer than 10 riders per hour in service but offers the only transit connection between North Lawrence and Lawrence. Improving frequency typically spurs ridership, and with better connections, the performance of Route 4 could improve greatly.
- **Begin Service at 7:13 AM; End Service after the 6:50 PM Departure.** Service on Route 4 currently begins at 6:03 AM and ends at 7:45 PM (last departure at 7:13 PM). Low ridership on departures before 7:13 AM and after 6:50 PM indicate that the resources necessary to operate that service could be better spent elsewhere. As a result, reducing the service span to approximately 7:13 AM to 7:13 PM would benefit users in some other way or on some other part of the system.

Lawrence Transit System

ROUTE 5

31st & Iowa to East Hills Business Park

SERVICE DESIGN

Route 5 is a Lawrence Transit route that operates between Pine Ridge Plaza and East Hills Business Park. The route travels primarily along Iowa Street, 23rd Street, and Venture Park Drive (Figure 1). Route 5 provides service to East Hills Business Park, Lawrence Community Shelter, Haskell Indian Nations University, and Pine Ridge Plaza.

ALIGNMENT/SERVICE PATTERNS

Route 5 has one service pattern for weekday and Saturday service. Departing outbound from the intersection of 31st Street and Iowa Street, Route 5 turns right on Ousdahl Road, right on 33rd Street, right on Iowa Street, right on 23rd Street, right on Massachusetts Street, and left on Indian Avenue to reach Haskell Indian Nations University. Route 5 then turns left on Barker Avenue, right on 23rd Street, right on Franklin Road, right on 25th Terrace, right on O'Connell Road, right on Venture Park Drive, left on Greenway Circle, right on Greenway Drive, and then terminates across from General Dynamics.

Returning inbound from General Dynamics, Route 5 continues on Greenway Circle, and then turns left on Venture Park Drive and left on O'Connell Road, before returning to 23rd Street. Route 5 then continues along the inbound alignment until the intersection of Iowa Street and 31st street, where the route turns left and terminates.

As of August 1st, 2016, Route 5 was realigned and no longer serves the Lawrence Community Shelter.

Figure 1 | Route Map



Source: Lawrence Transit, August 2015-July 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 5 and several Lawrence Transit routes at 31st Street and Iowa Street (Pine Ridge Plaza). There are also transfer opportunities at several other points along the route, particularly along 23rd Street (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Pine Ridge Plaza	Route 7, Route 9, Route 11
Barker Avenue and Indian Avenue	Route 27
Haskell Avenue and 23rd Street	Route 1
Ousdahl Road and 23rd Street	Route 38
Harper Street and 23rd Street	Route 1
East Hills Business Park	Route 15

SERVICE SCHEDULE

Route 5 operates service Monday-Saturday (Figure 3) year round. On weekdays and Saturdays, the route runs every 60 minutes from 6:30 AM to 7:58 PM. Route 5 does not operate on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:30 AM – 7:58 PM	60	14/14
Saturday	6:30 AM – 7:58 PM	60	14/14
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 5 ranks sixth of nine Lawrence Transit routes in terms of weekday ridership and fifth of nine in terms of ridership per trip (Figure 4). On average, the route carries 181 passengers, or 6.5 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, the route carries 136 passengers, or 4.9 per trip.

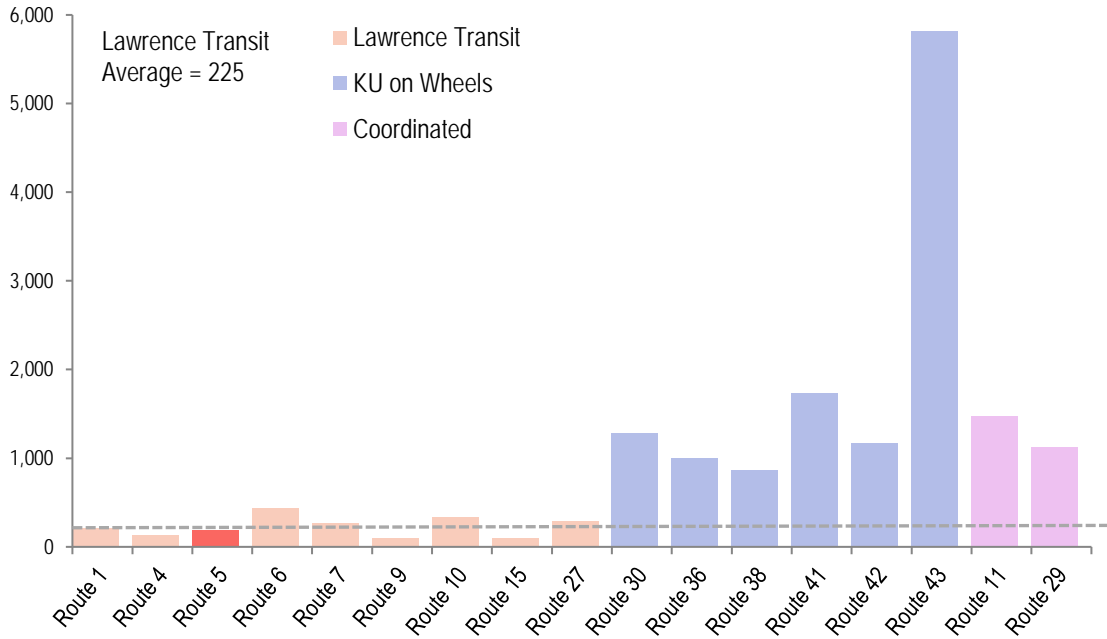
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	181	28	6.5	6.5	5 of 9
Saturday	134	28	4.9	4.7	4 of 8

Source: Lawrence Transit, 2016

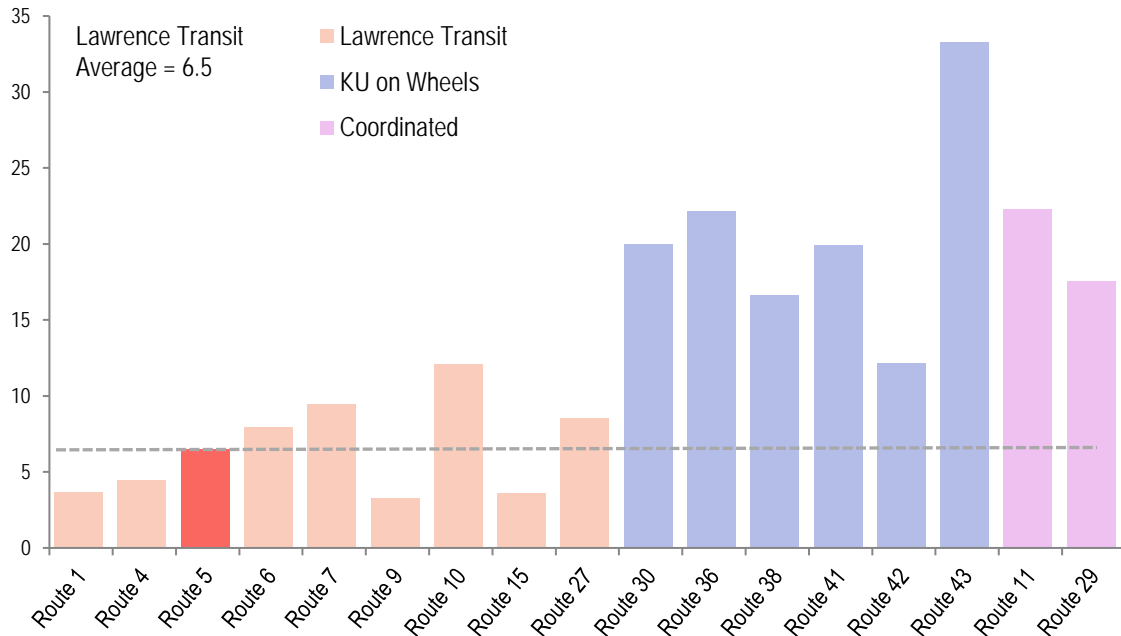
ROUTE EVALUATION | ROUTE 5
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

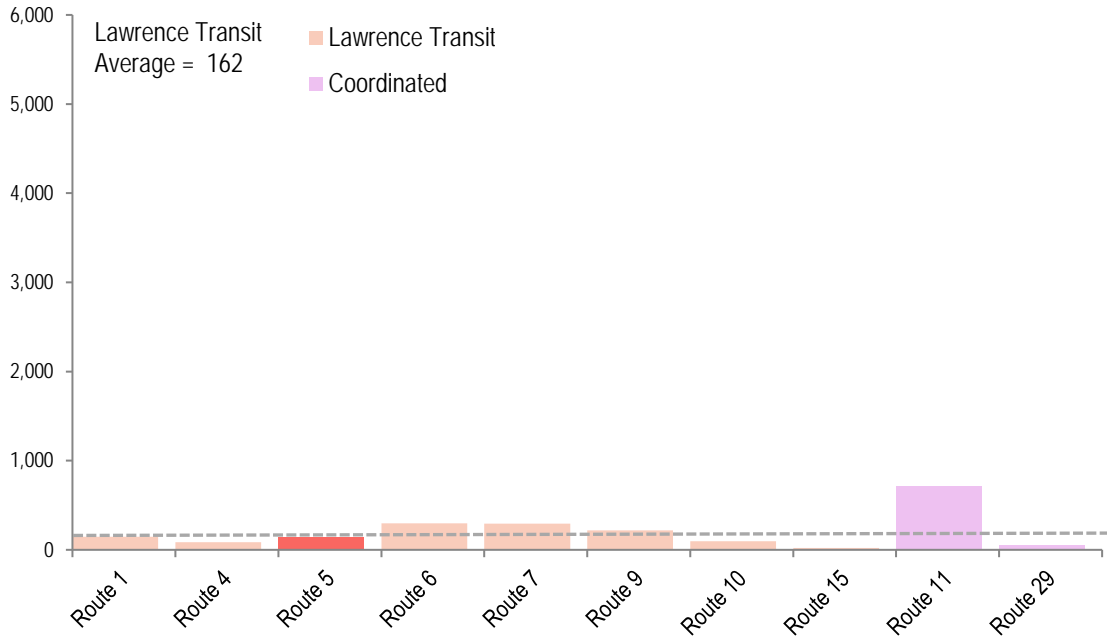
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

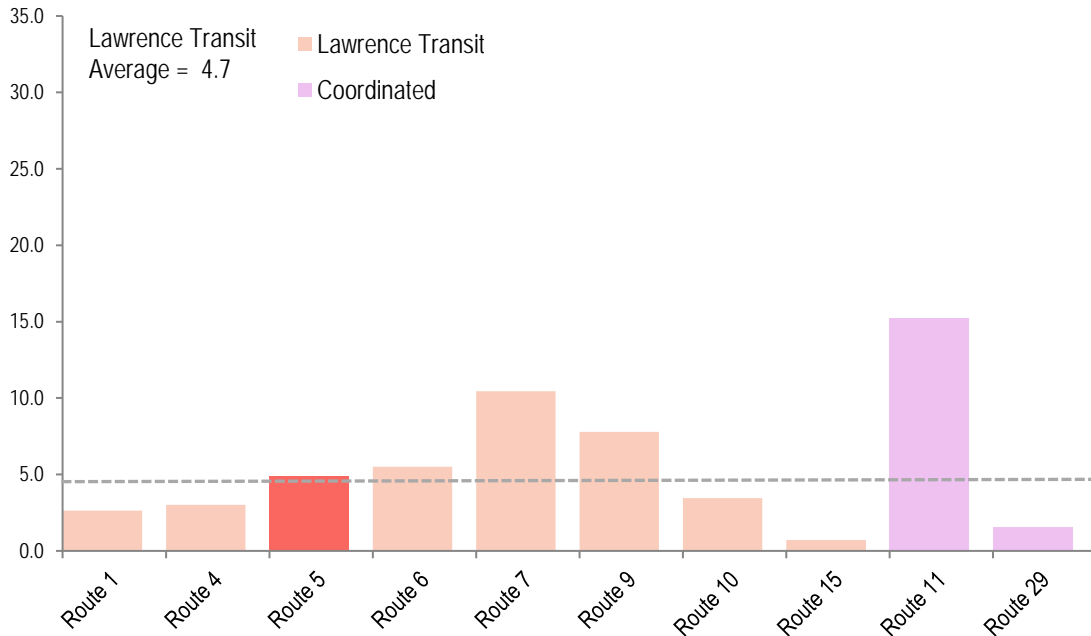
ROUTE EVALUATION | ROUTE 5
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 5 are located at the beginning and end of the route, at the East Hills Business Park and the stop at 31st Street and Iowa Street (Figure 9). With 27 total boardings, East Hills Business Park records the highest number of combined inbound boardings and alightings on Route 5. Aside from East Hills Business Park, 23rd Street and Haskell Avenue, and 31st Street and Iowa Street, no stops generate more than 10 inbound boardings and alightings per weekday. Stops at 31st Street and Iowa Street, and along 23rd Street (University Bookstore) serve numerous national and local commercial and retail stores. On weekday outbound service the stop East Hills Business Park handles 31 alightings.

Saturday inbound ridership patterns on Route 5 are similar to weekday patterns, but with significantly lower volumes (Figure 14-Figure 17). Only two inbound stops generate more than 10 combined boardings and alightings: 25th Street and Iowa Street, and 31st Street and Iowa Street. Outbound, the stop 25th and Franklin Street, near the Douglas County Jail, generates 39 combined boardings and alightings on Saturday.

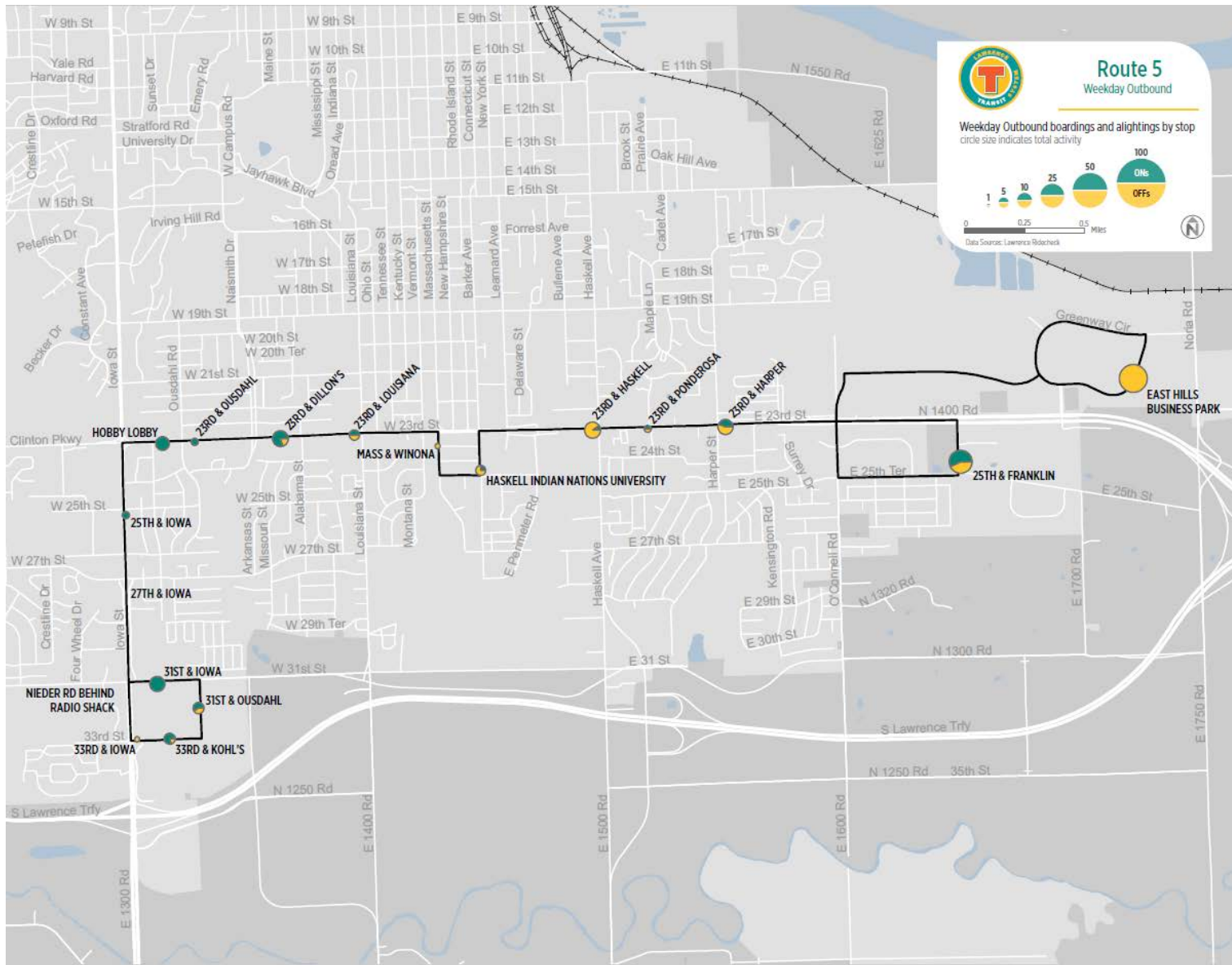
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
East Hills Business Park	27	East Hills Business Park
23rd Street / Haskell Avenue	10	Local retail stores; Haskell Indian Nations University
University Bookstore	6	Dillons
27th Street / Iowa Street	6	Local and national retail stores
31st Street / Iowa Street	14	Pine Ridge Plaza; multiple national retail stores

*Weekday outbound ridership (boardings and alightings) for Route 5 only.

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

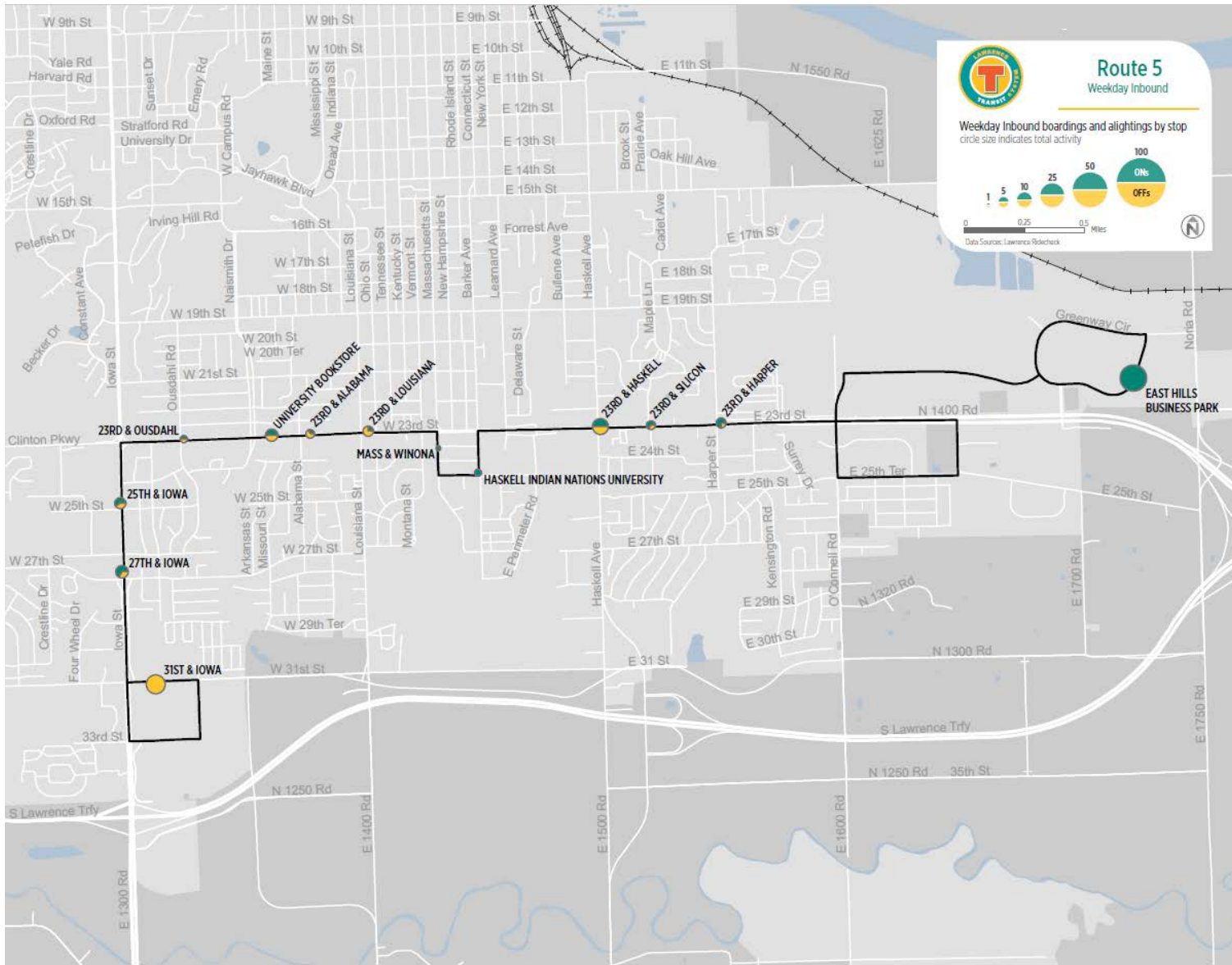
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

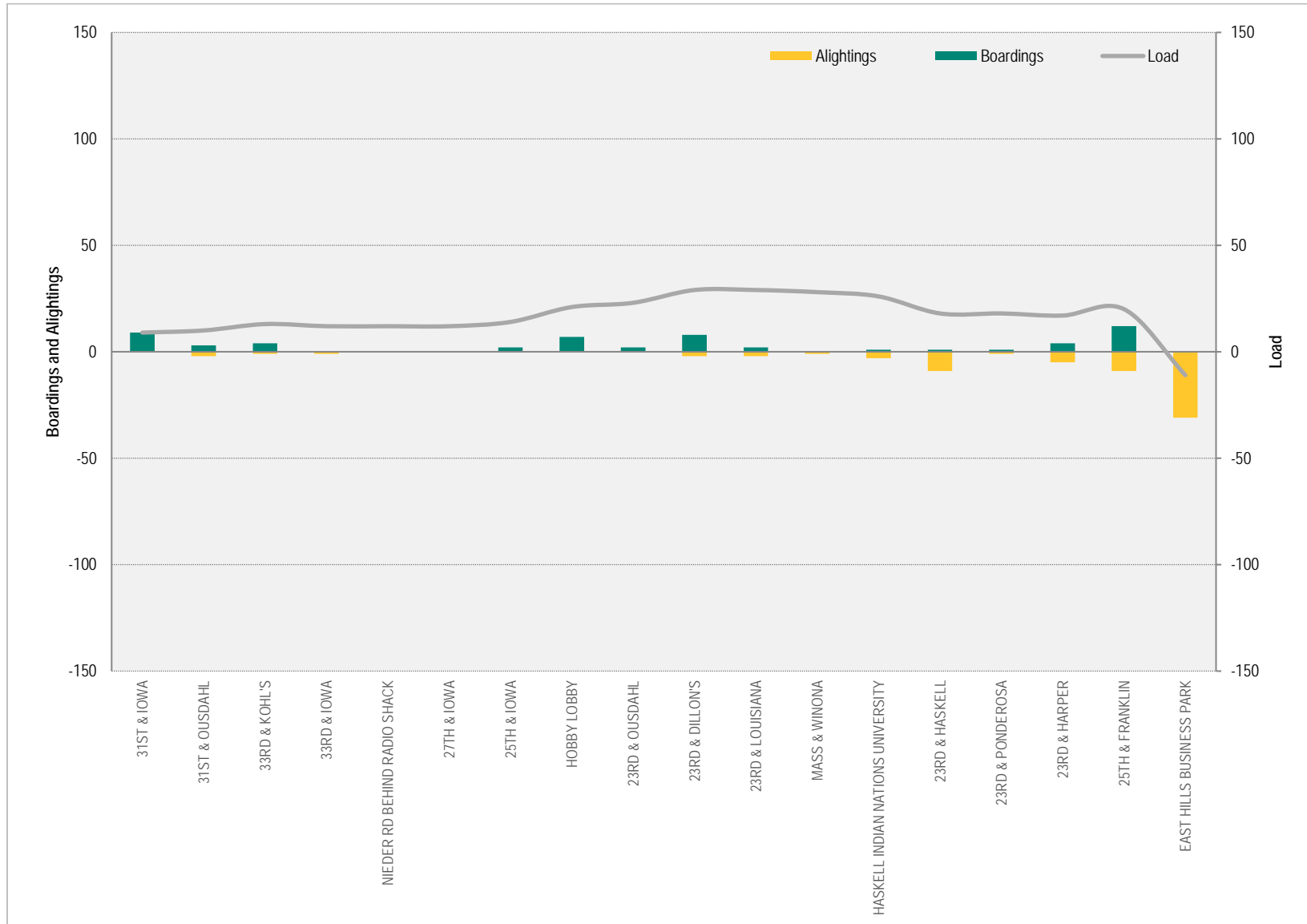
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

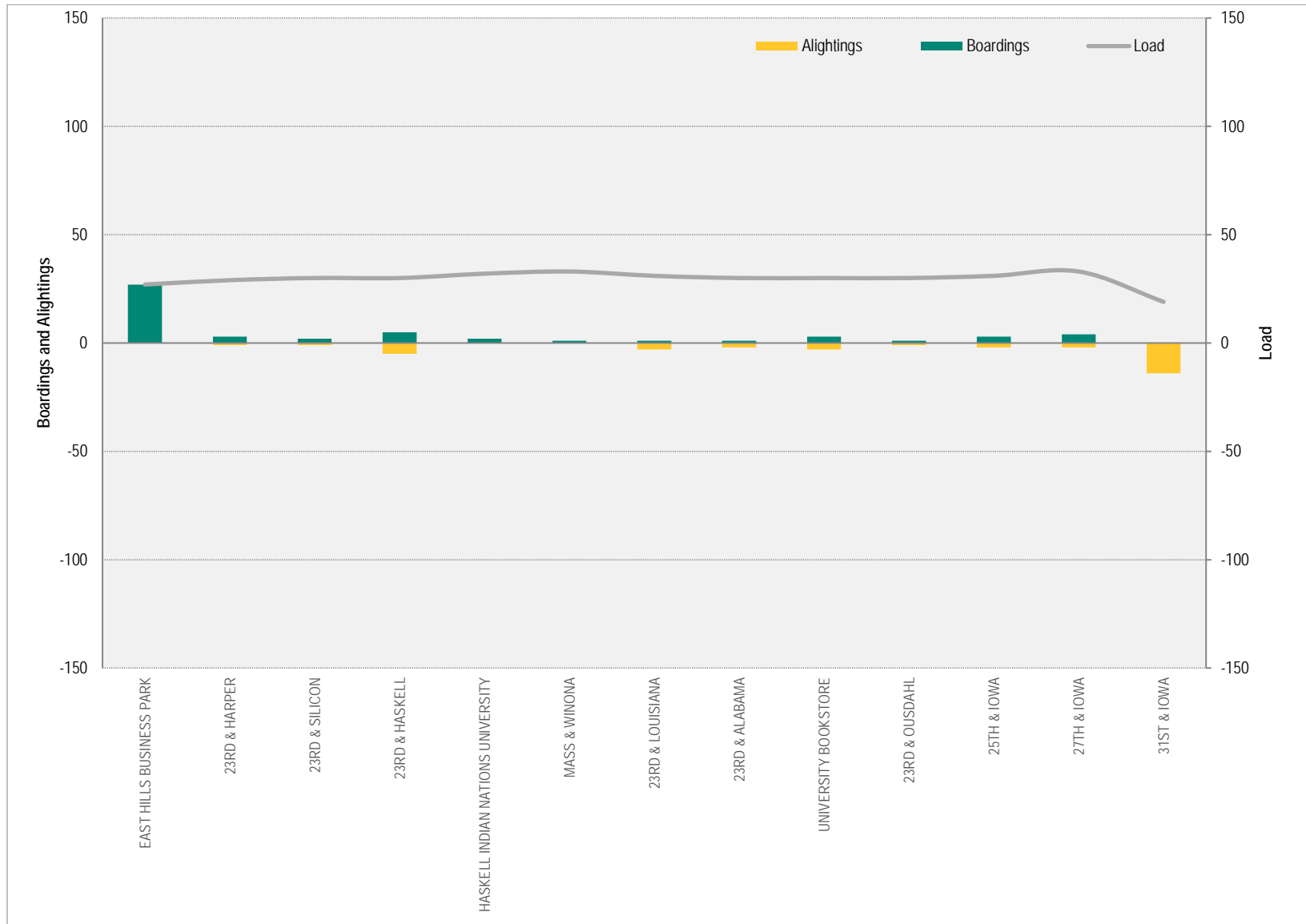
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

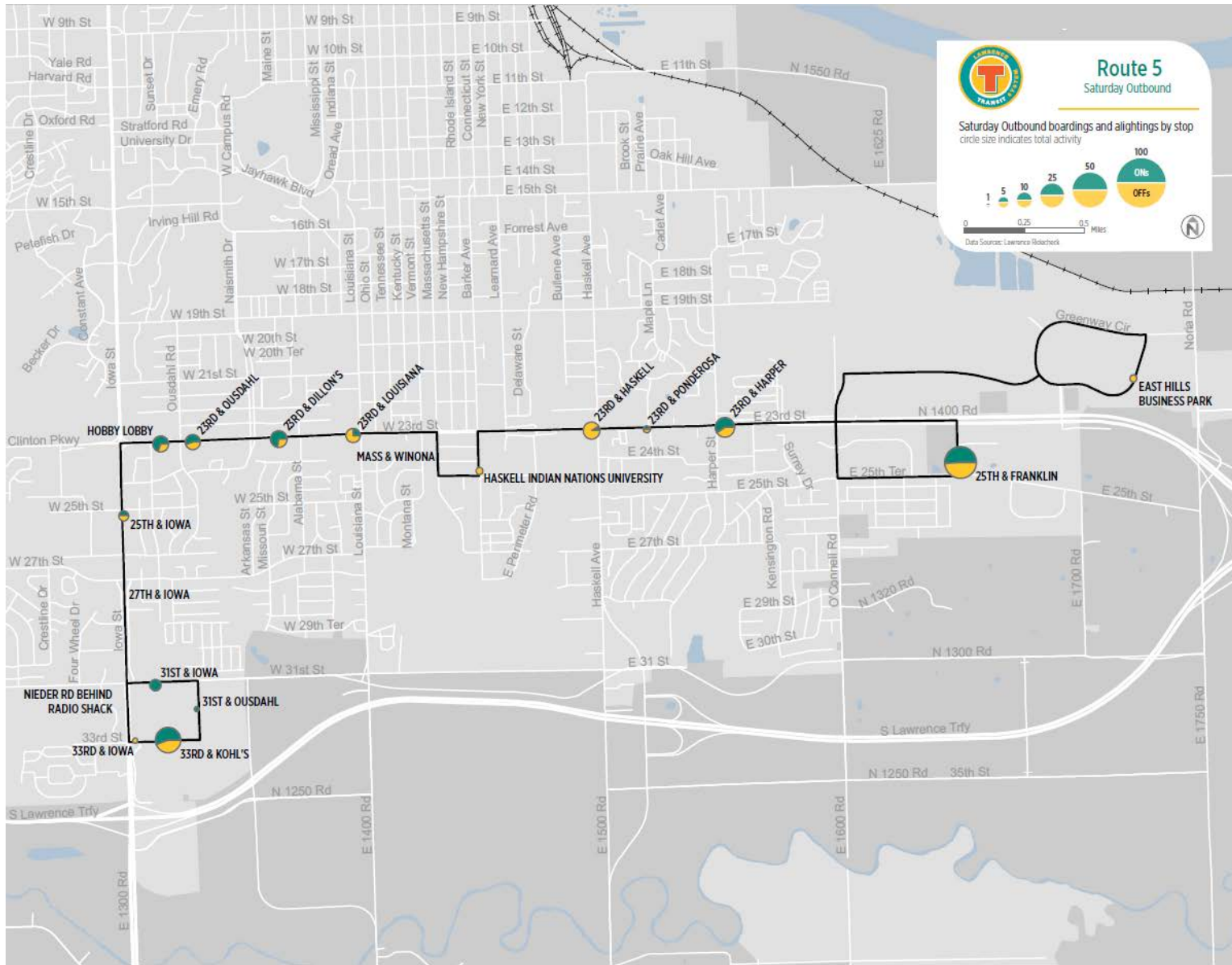
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

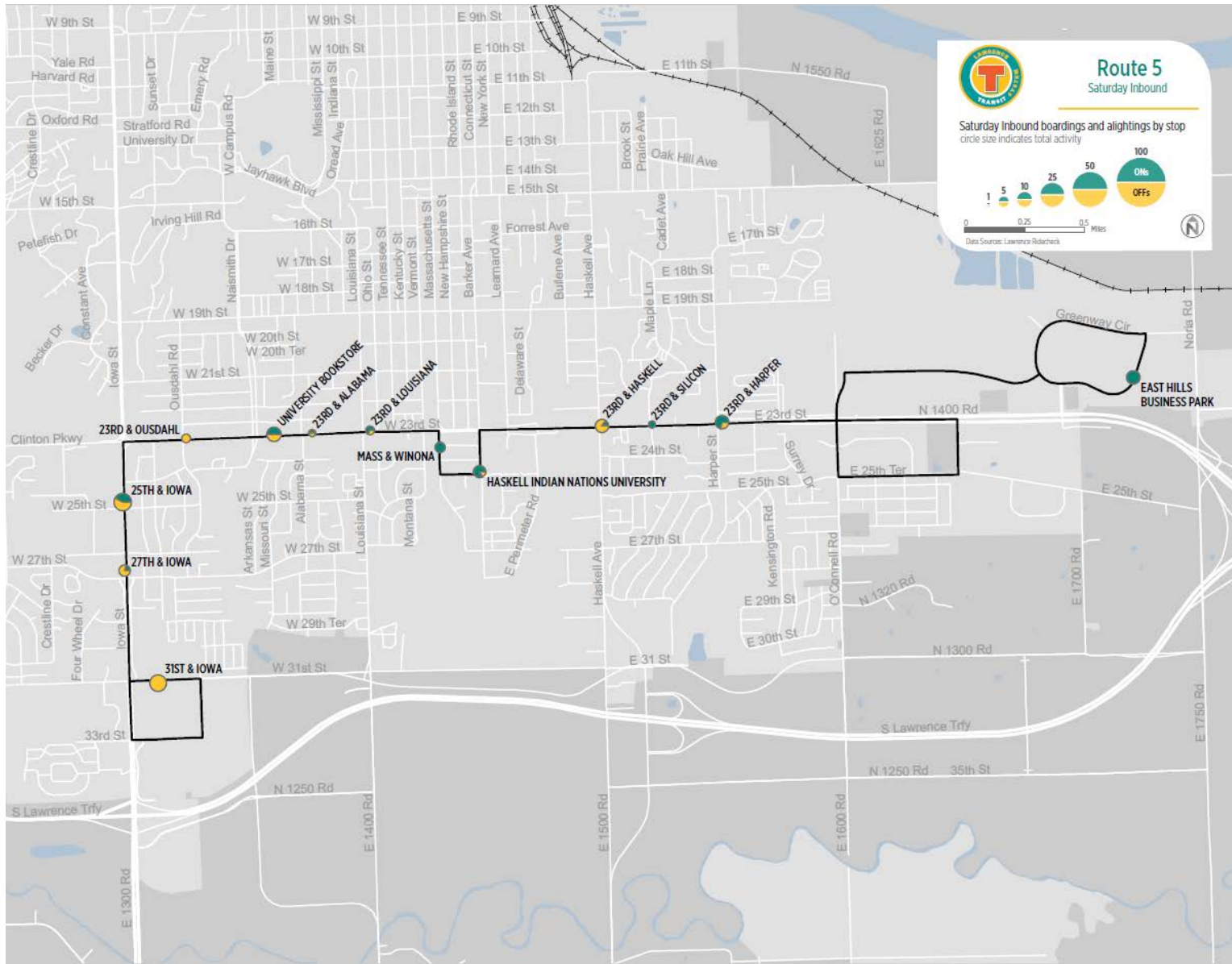
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

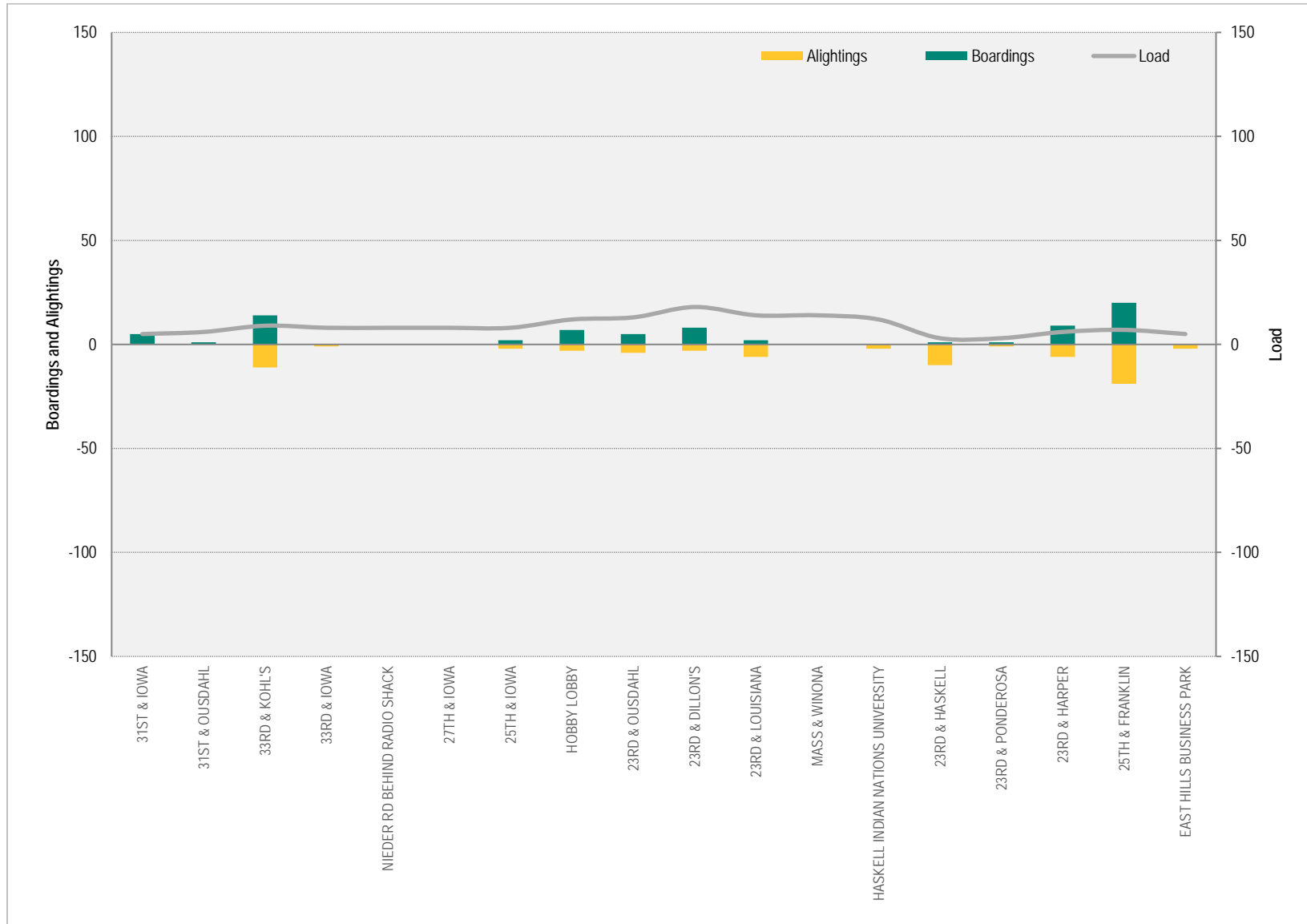
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

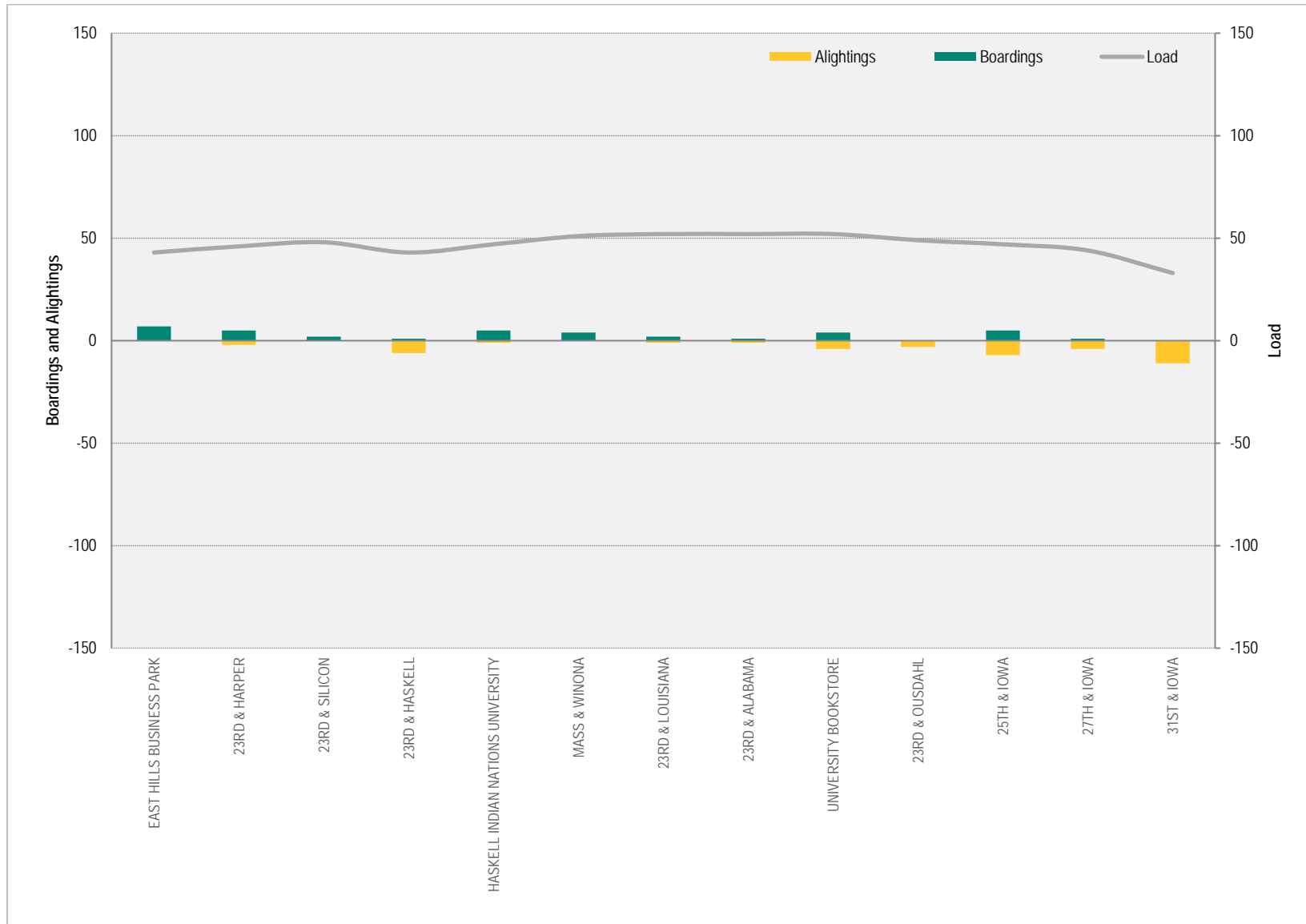
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

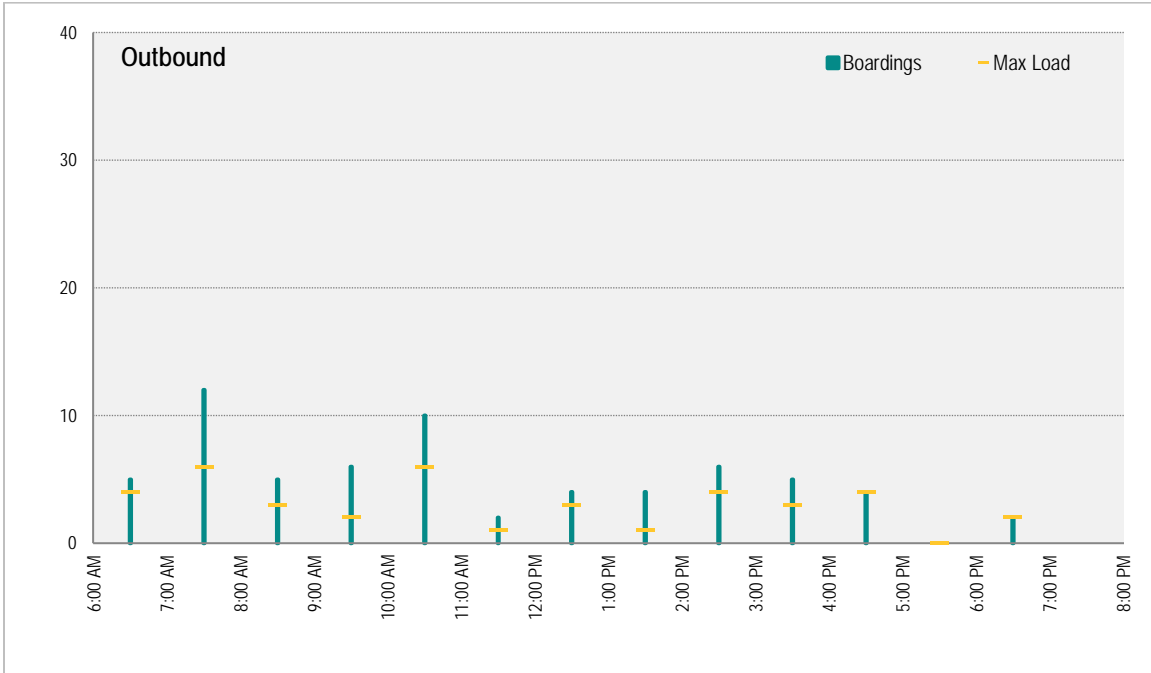
RIDERSHIP BY TRIP

On weekdays, Route 5 ridership is highest in the outbound direction between 7:00 and 11:00 AM. During this period, trips average eight boardings, and two trips carrying 10 passengers or more. Inbound ridership is low throughout the day, with no trips carrying more than five passengers (Figure 18 and Figure 19).

On Saturday, outbound Route 5 ridership peaks at 7:30 AM, carrying 12 passengers. Traveling in the inbound direction, no trips exceed six passengers (Figure 20 and Figure 21).

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

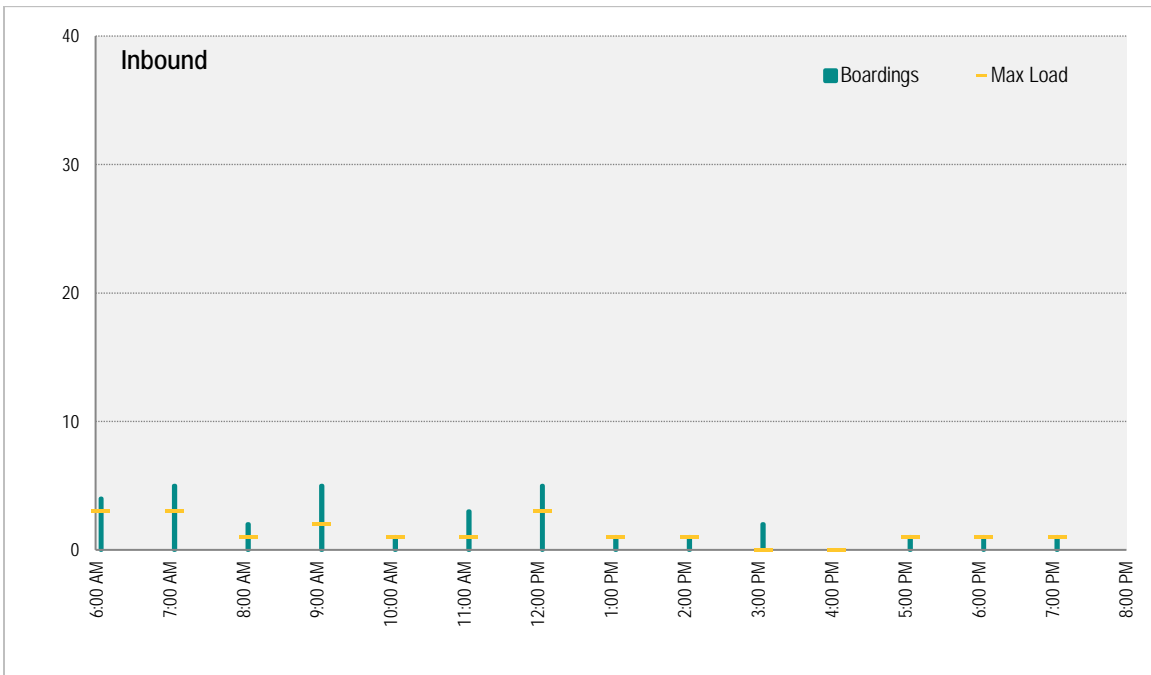
Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 7:30 PM outbound trip.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart

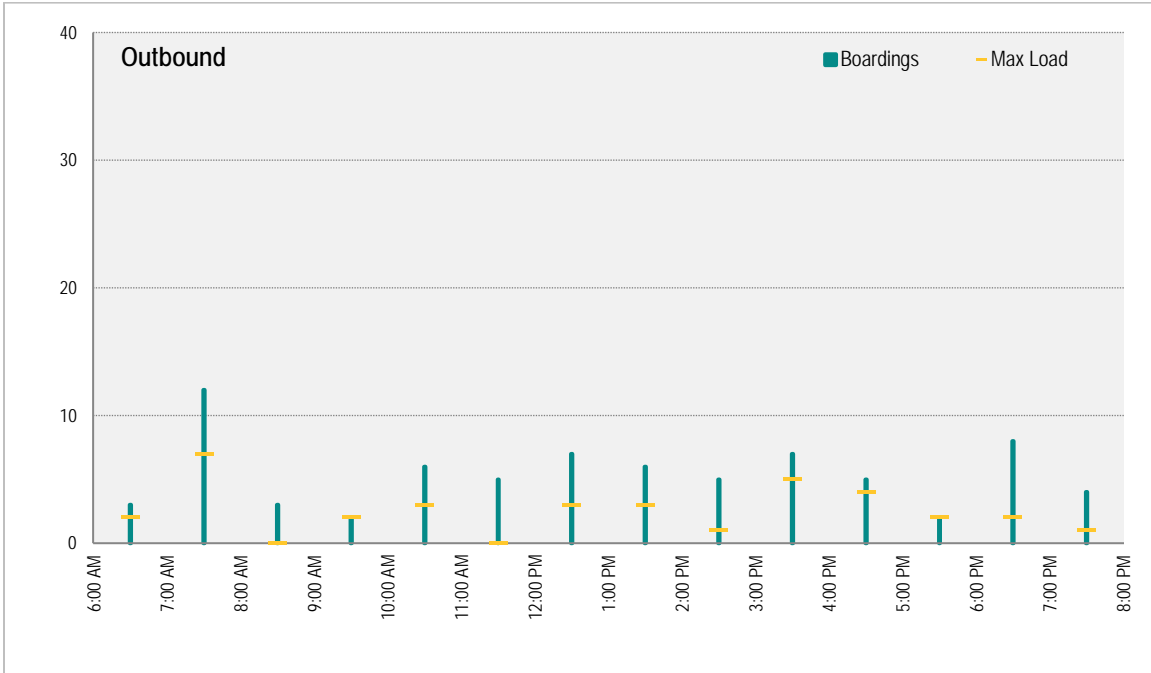


Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

ROUTE EVALUATION | ROUTE 5
Lawrence Transit

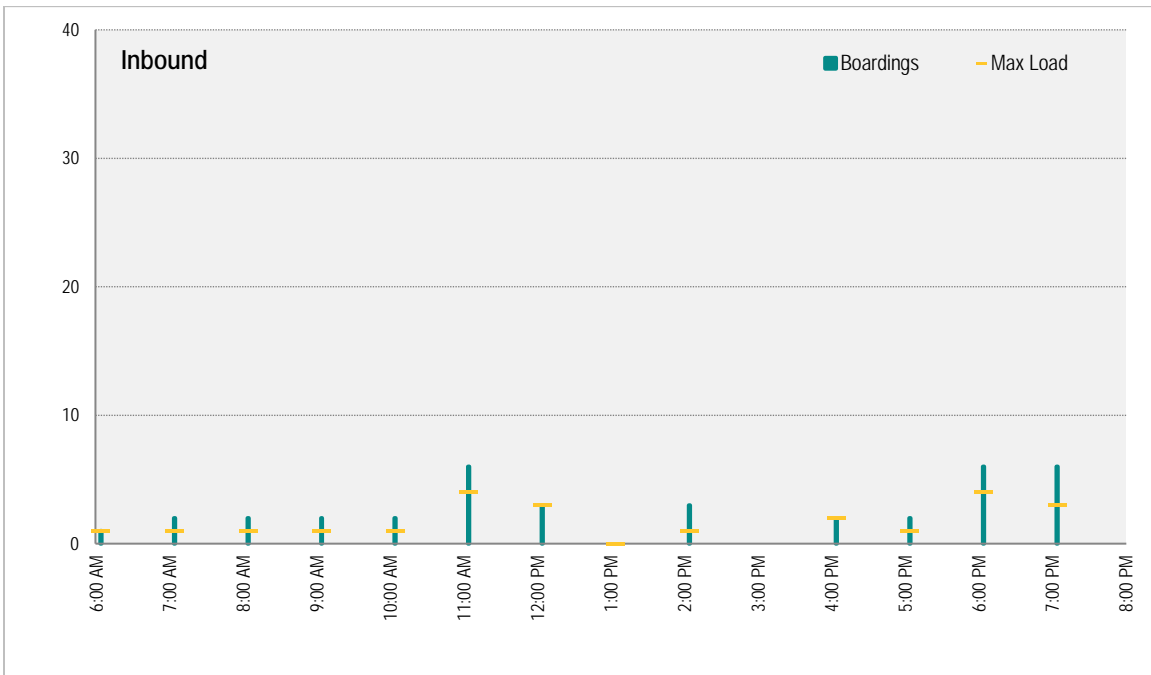
Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

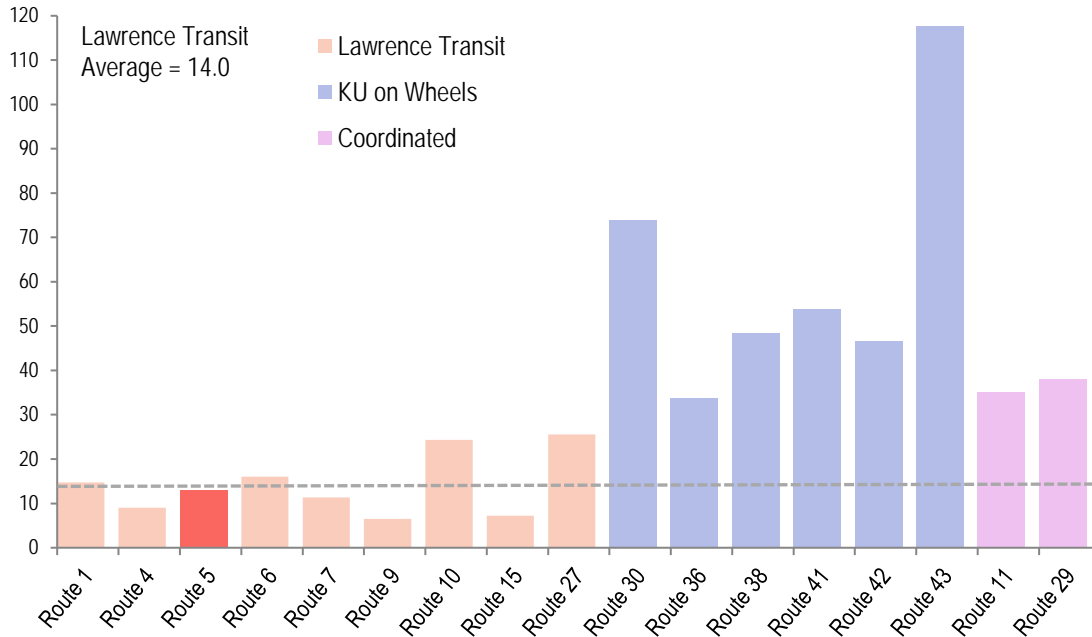
In terms of average passengers per hour, Route 5 is the fifth most productive Lawrence Transit bus route (Figure 22). The route carries 13.0 passengers per hour on weekdays, 9% less than the system average (Figure 23). Route 5 carries 9.8 passengers per hour on Saturdays (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	181	13.9	13.0	14.0	5 of 9
Saturday	136	13.9	9.8	9.7	5 of 8

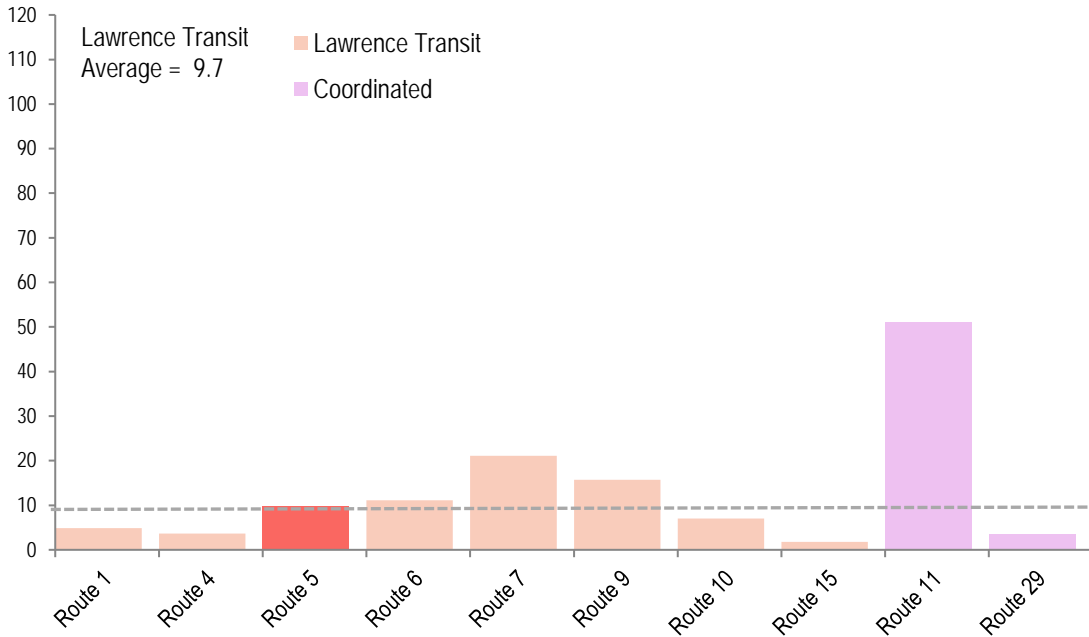
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 48% of Route 5 time points were served “on-time” during the survey period (Figure 25). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule. On Saturdays, approximately 51% of Route 5 time points were served “on-time” during the survey period.

Both weekday and Saturday on-time performance was affected by a high rate of late departures, with nearly 44% of weekday trips and approximately 30% of Saturday trips departing stops late. On Saturdays, approximately 20% of time points are served early, with buses departing before their scheduled departure time.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	48.4%	50.7%
Early	7.8%	19.6%
Late	43.8%	29.7%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 5 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Streamline Route by Reducing Redundancy.** Route 5 has an on-time performance of less than 50%, with a significant number of late trips. Streamlining the route could help improve on-time performance. Currently Route 5 and Route 15 follow the same alignment between Haskell Avenue and East Hills Business Park. Both also serve the Lawrence Community Shelter. If Route 5 were to bypass the shelter, connections to Route 15 could be made at several stops that the two routes would still have in common.

As of August 1st, 2016, Route 5 was realigned and no longer serves the Lawrence Community Shelter. Route 1 currently serves the shelter.

- **Consolidate Mid-Route Outbound Stops to Streamline Service.** Route 5 has several closely spaced bus stops that could likely be consolidated to speed up service and improve on-time performance. For example, there are three westbound stops along 23rd Street, between Ohio Street and Naismith Drive. Similarly, there are three stops in the eastbound direction on 23rd Street between the Haskell Avenue and Harper Street intersections. In both cases, two stops would be sufficient.
- **Improve Frequency on Weekdays.** Route 5 appears to serve a large percentage of commuters traveling to the East Hills Business Park. Hourly service is not frequent enough to attract users who have other transportation options, or users with non-traditional work schedules. While Route 5 does not demonstrate high average ridership currently, Lawrence Transit has had a goal of improving most routes in the system to a frequency of 30 minutes or less, and Route 5 ridership could benefit from this change.

As of August 1st, 2016, Route 5 operates on a 30-minute frequency. Data collected as part of this study supports the change in frequency.

- **Begin Service at 7:04 AM; End Service after the 7:04 PM Departure.** Service on Route 5 currently begins at 6:04 AM and ends at 7:58 PM (last departure at 7:30 PM). On weekdays, fewer than 10 combined inbound and outbound passengers board Route 5 before 7:00 AM. Low weekday and Saturday ridership on departures before 7:00 AM and after 7:00 PM indicates that the resources necessary to operate that service could be better spent elsewhere.
- **Begin and End Saturday Service at 25th Street and Franklin Road.** The stop at East Hills Business Park generates fewer than 10 combined boardings and alightings on Saturdays. Conversely, traveling outbound, 27% of combined passenger boardings and alightings occur at the 25th Street at Franklin Road stop, adjacent to the Douglas County Jail. Shortening Route 5 will reduce the route's cycle time while impacting few existing passengers.

Lawrence Transit System

ROUTE 6

Downtown to 6th & Wakarusa

SERVICE DESIGN

Route 6 is a Lawrence Transit route that operates between the downtown transit hub and 6th Street and Wakarusa Drive. The route travels primarily along 6th Street (Figure 1). Route 6 provides service to downtown Lawrence, Lawrence Memorial Hospital, and Free State High School.

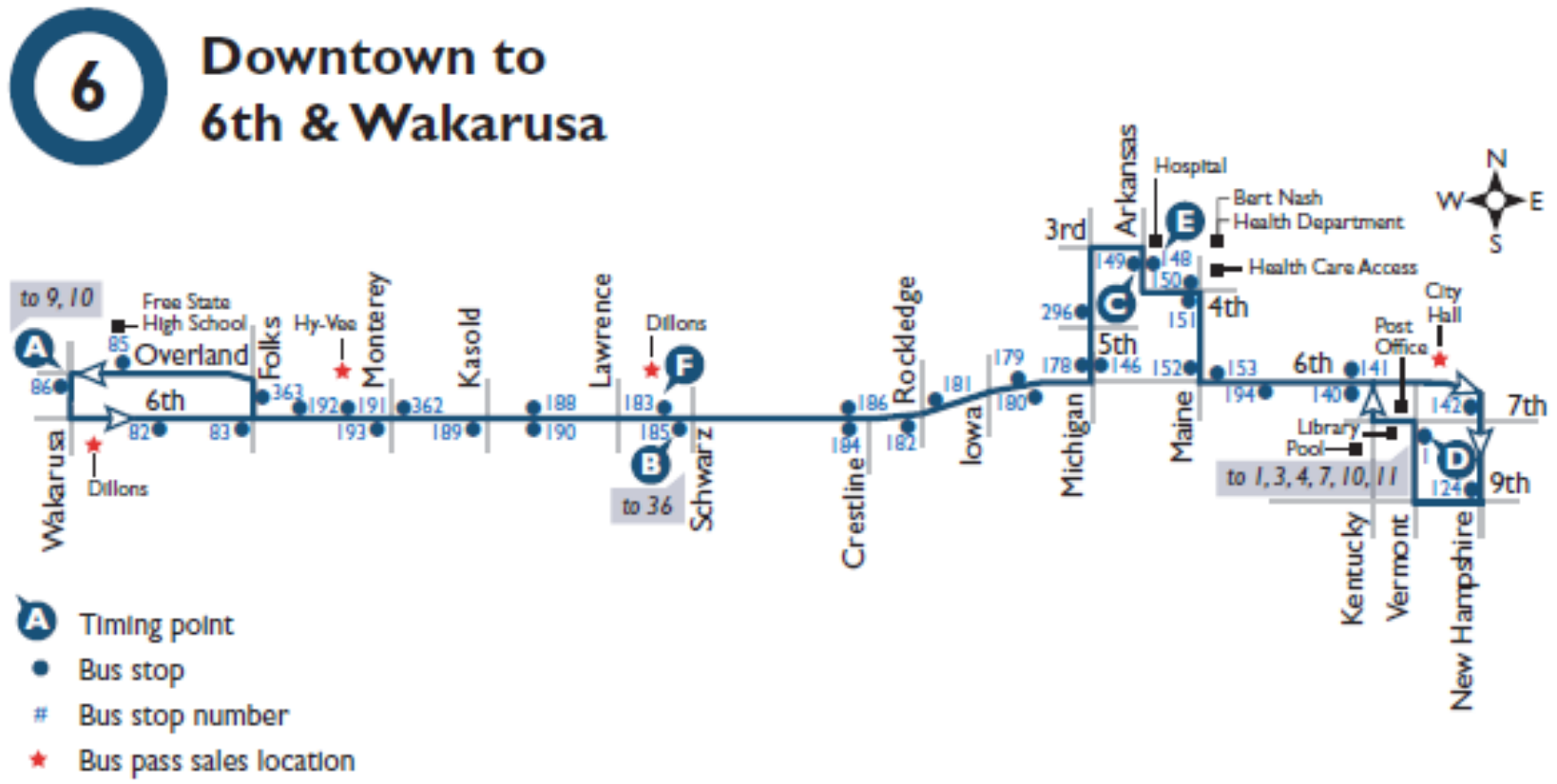
ALIGNMENT/SERVICE PATTERNS

Route 6 has one service pattern for weekday and Saturday service. Departing outbound from the intersection of 6th Street and Wakarusa Drive, Route 6 turns left on 7th Street, right on Kentucky Street, left on 6th Street, right on Maine Street, left on 4th Street, right on Arkansas, left on 3rd Street, left on Michigan Street, and right on 6th Street. Following 6th Street, Route 6 then turns right on Folks Road, and left on Overland Drive, terminating at the intersection of Overland and Wakarusa Drive.

Returning inbound, Route 6 turns left on 6th Street, left on Michigan Street, right on 3rd Street, right on Arkansas Street, left on 4th Street, and right on Maine Street. From Maine Street, Route 6 turns left back onto 6th Street, right on New Hampshire, right on 9th Street, and right on Vermont Street, terminating at the downtown transit hub.

As of August 1st, 2016, Route 6 serves Rock Chalk Park and Sports Pavilion Lawrence and no longer serves Lawrence Memorial Hospital.

Figure 1 | Route Map



Source: Lawrence Transit; August 2015 – August 2016
 New route alignment effective as of August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 6 and several Lawrence Transit routes at the Downtown Transit Hub. There are also transfer opportunities at several other points along the route, including at Wakarusa Drive and Overland Drive (Route 9 and Route 10) and on 6th Street (Route 36) (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Downtown Transit Hub	Route 1, Route 3, Route 4, Route 7, Route 10, Route 11, Route 15
Wakarusa Drive and Overland Drive	Route 9, Route 10
W 6 th Street and Schwarz Road	Route 36

SERVICE SCHEDULE

Route 6 operates service Monday-Saturday year round (Figure 3). On weekdays and Saturdays, the route runs every 30 minutes from 6:03 AM to 7:57 PM. Route 6 does not operate on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:03 AM – 7:57 PM	30	27/27
Saturday	6:03 AM – 7:57 PM	30	27/27
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 6 ranks first of nine Lawrence Transit routes in terms of weekday ridership and fourth of nine in terms of ridership per trip (Figure 4). On average, the route carries 429 passengers, or 8.0 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 6 carries 298 passengers, or 5.5 passengers per trip.

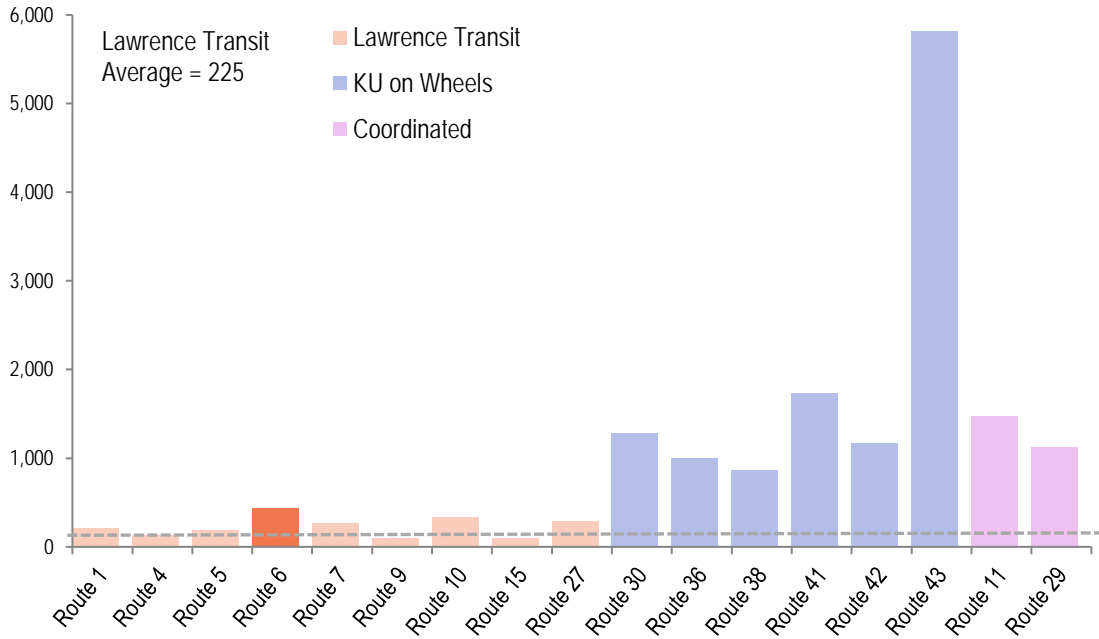
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	429	54	8.0	6.5	4 of 9
Saturday	298	54	5.5	4.7	3 of 8

Source: Lawrence Transit, 2016

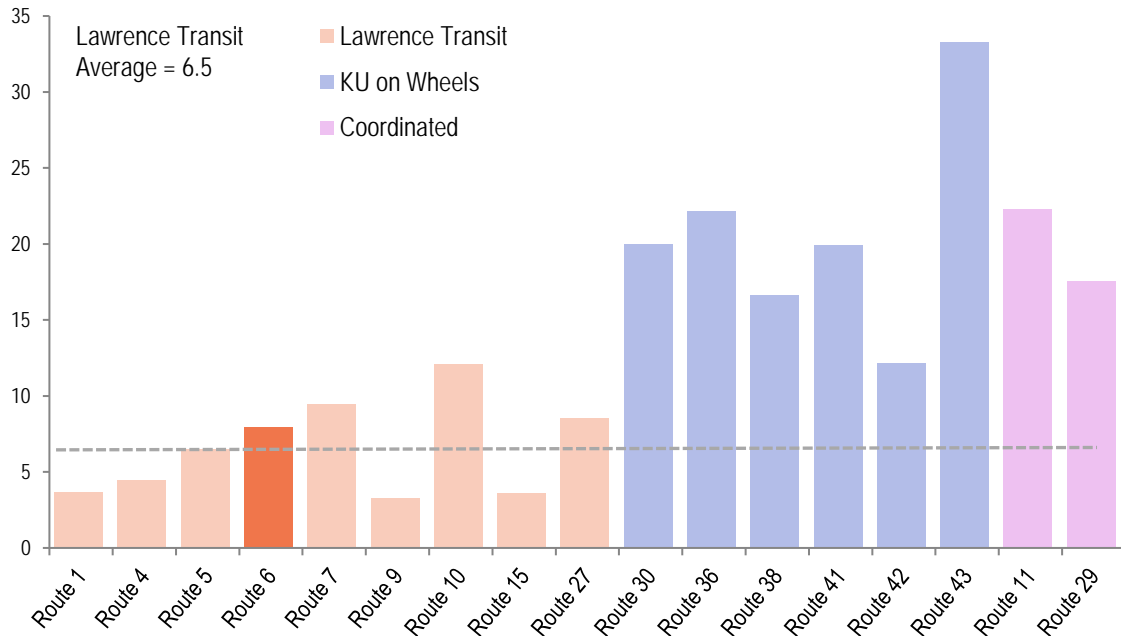
ROUTE EVALUATION | ROUTE 6
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

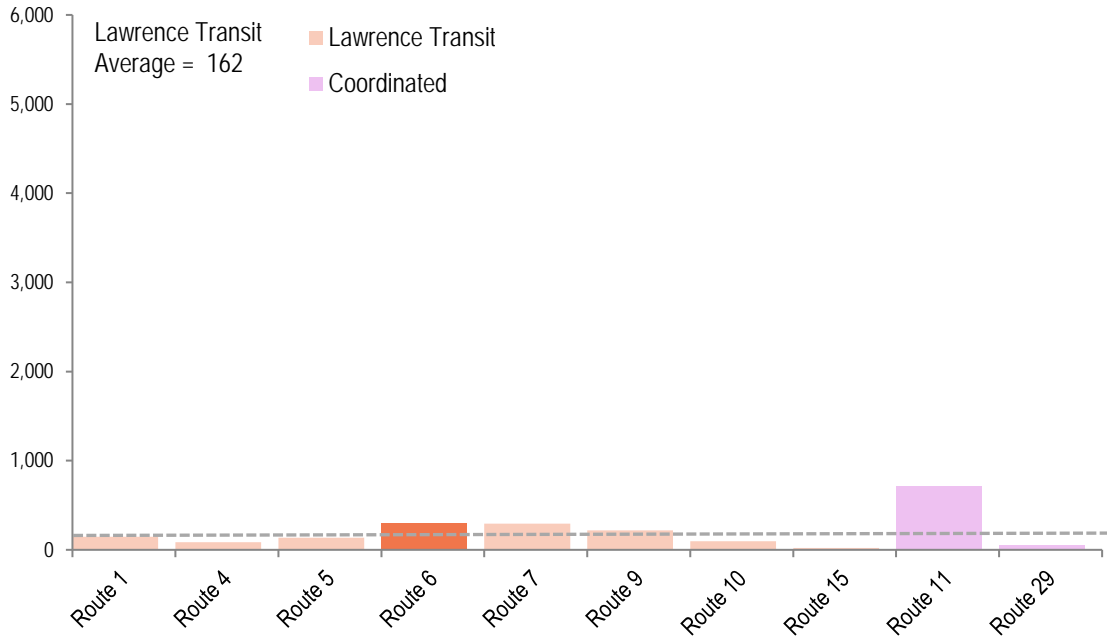
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

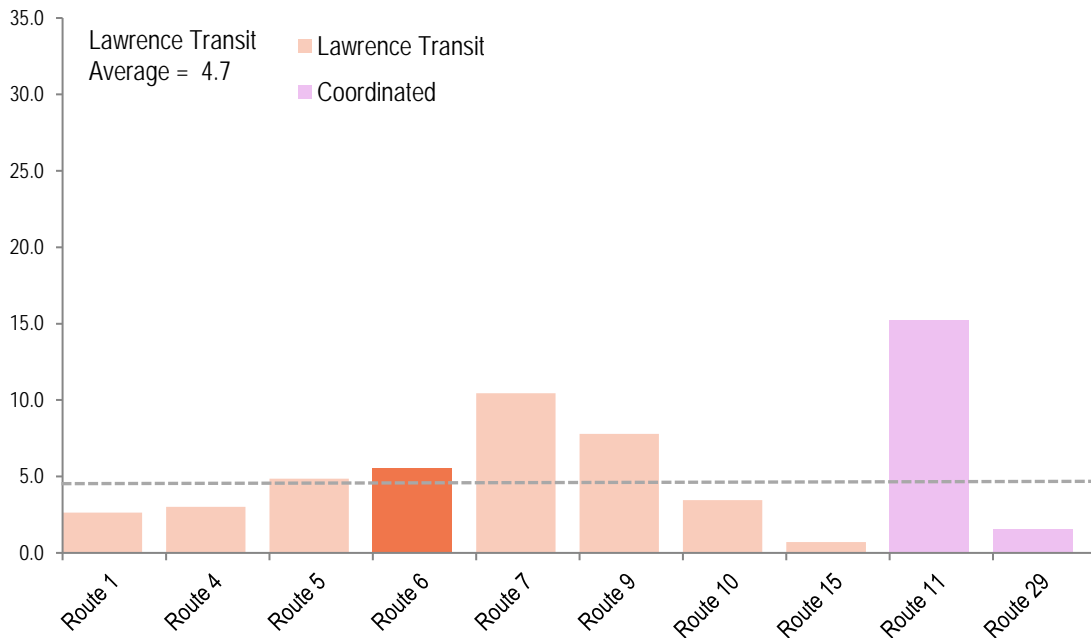
ROUTE EVALUATION | ROUTE 6
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest inbound weekday ridership stops on Route 6 are located in downtown Lawrence, and near Free State High School and the intersection of Wakarusa Drive and Overland Drive (Figure 9). Ridership activity at these stops ranges from 39 to 80 boardings and alightings. Other stops with more than 15 combined boardings and alightings per weekday in the inbound direction include: 6th Street and Maine Street, 6th Street and Crestline Drive, 6th Street and Colorado Street, and 6th Street and Lawrence Avenue. These stops serve residential neighborhoods, retail locations, and educational destinations. All other stops serve fewer than 13 combined boardings and alightings (Figure 10-Figure 13).

The highest ridership on weekdays traveling in the outbound direction is the stop at 7th Street and Vermont Street, which records 140 combined daily boardings and alightings. The following stops generate more than 15 daily boardings and alightings: Wakarusa Drive and Overland Drive, 6th Street and Kasold Drive, and 6th Street and Schwarz Road.

Saturday ridership patterns are similar to weekday patterns. However, ridership volume traveling outbound is equal to weekday ridership volumes, while inbound ridership is approximately two-thirds weekday inbound activity (Figure 14-Figure 17).

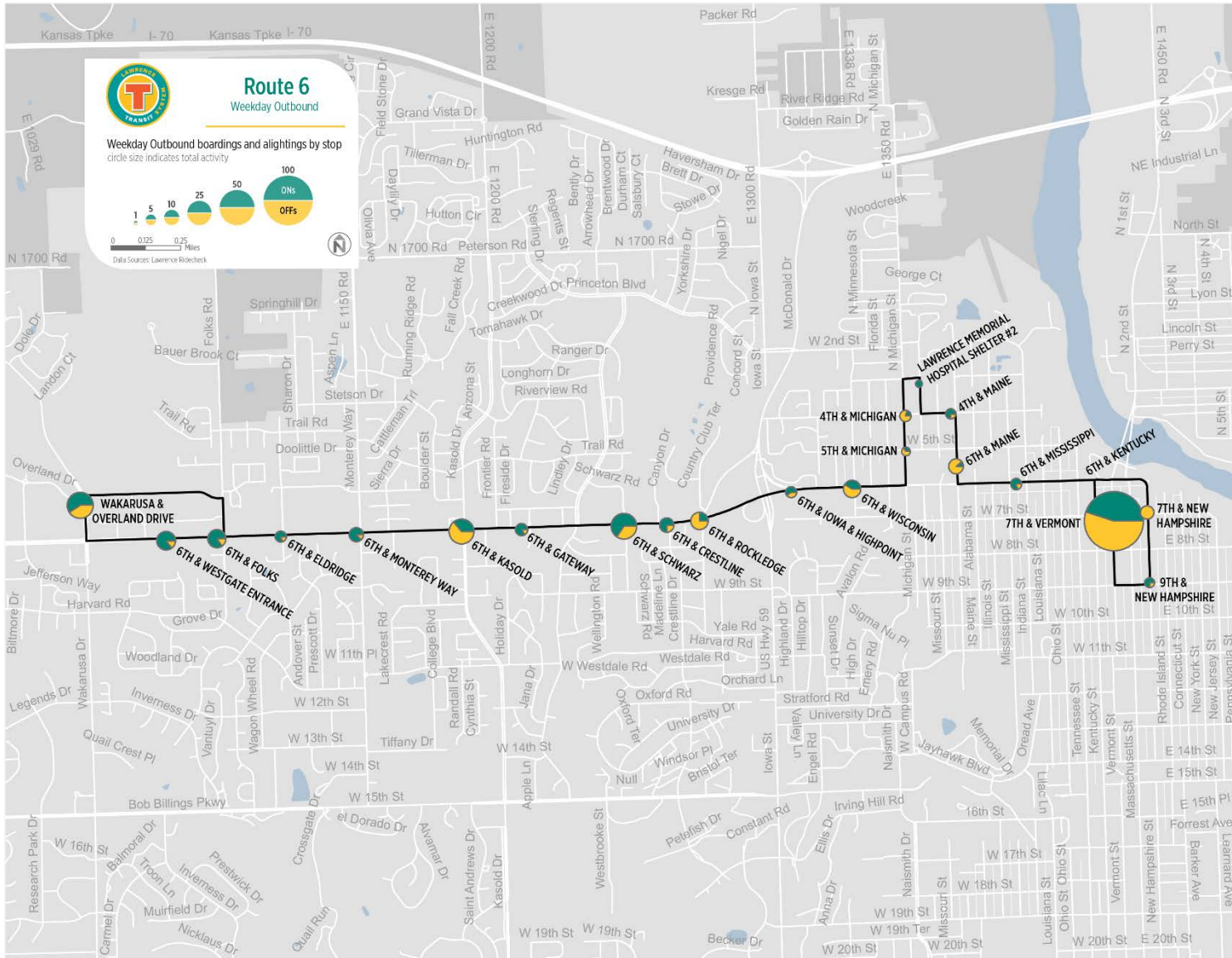
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
7th Street / Vermont Street	80	Downtown Lawrence; retail locations; Lawrence Public Library
Overland Drive / Free State High School	63	Free State High School; retail locations
Wakarusa Drive / Overland Drive	39	Walmart Supercenter; retail locations; residential complexes
6th Street / Maine Street	34	Residential neighborhoods; retail locations
6th Street / Crestline Drive	18	Residential complexes; Centennial Park

*Weekday inbound ridership (boardings and alightings) for Route 6 only

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

Figure 10 | Weekday Outbound Daily Ridership by Stop Map

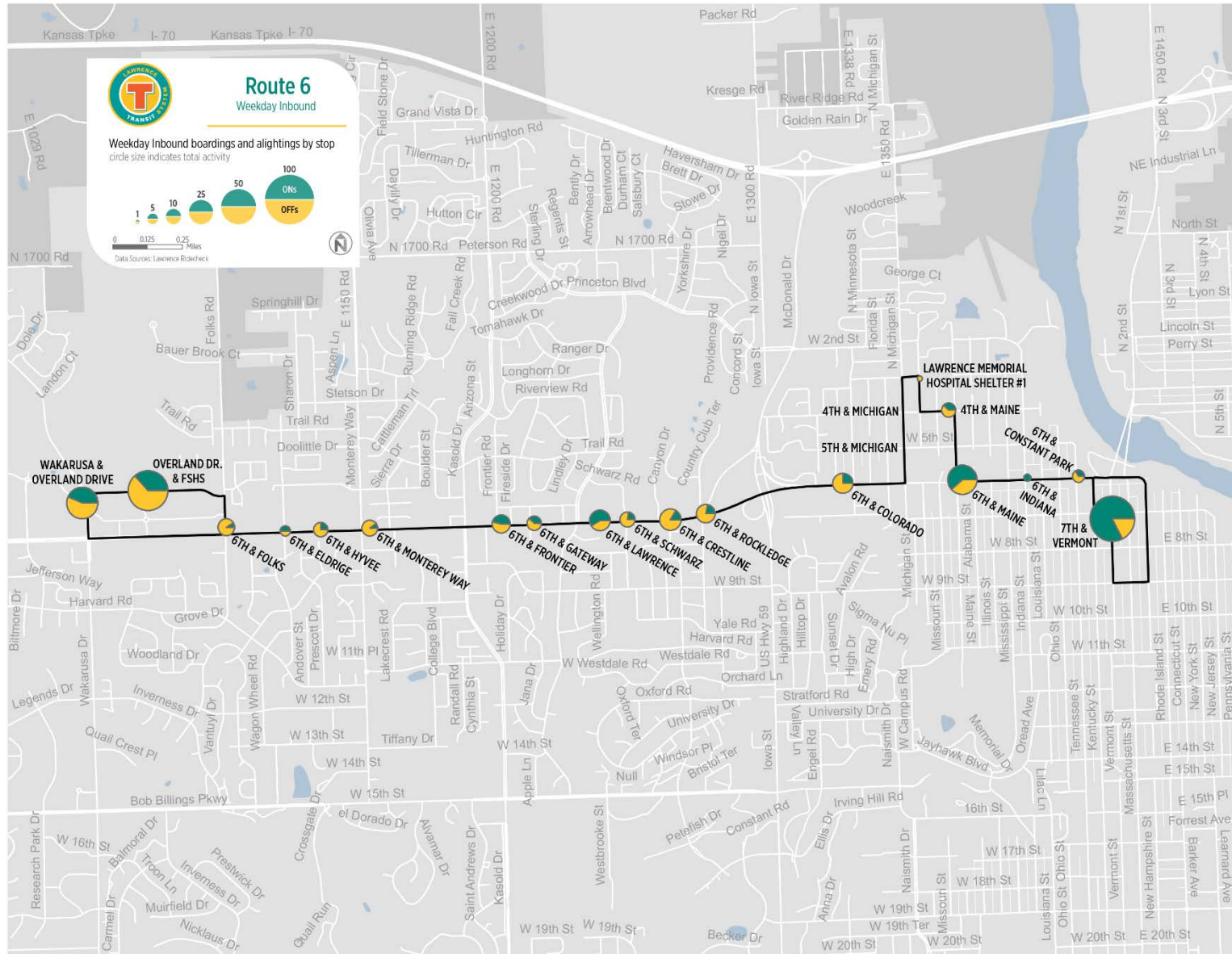


Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6

Lawrence Transit

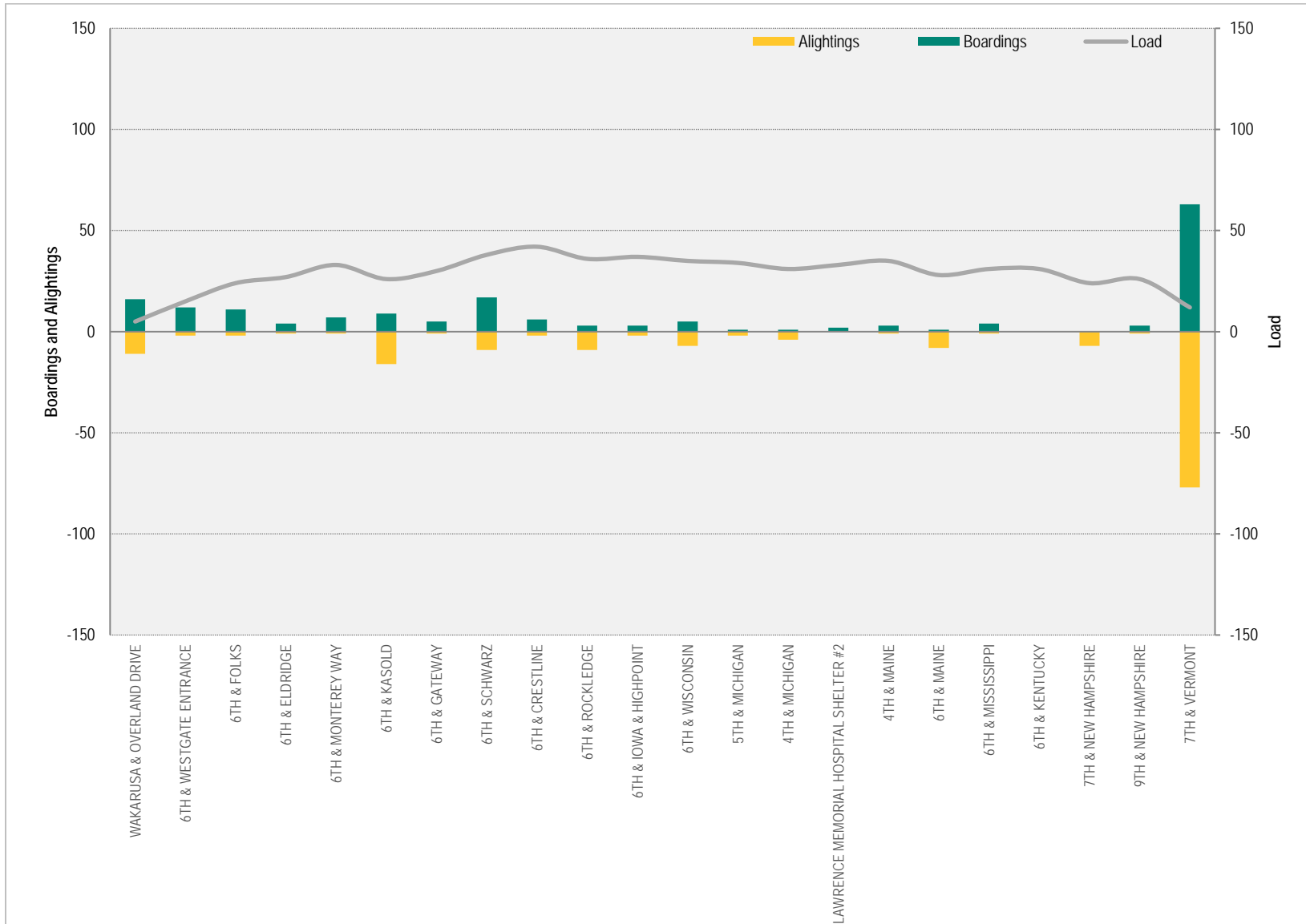
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

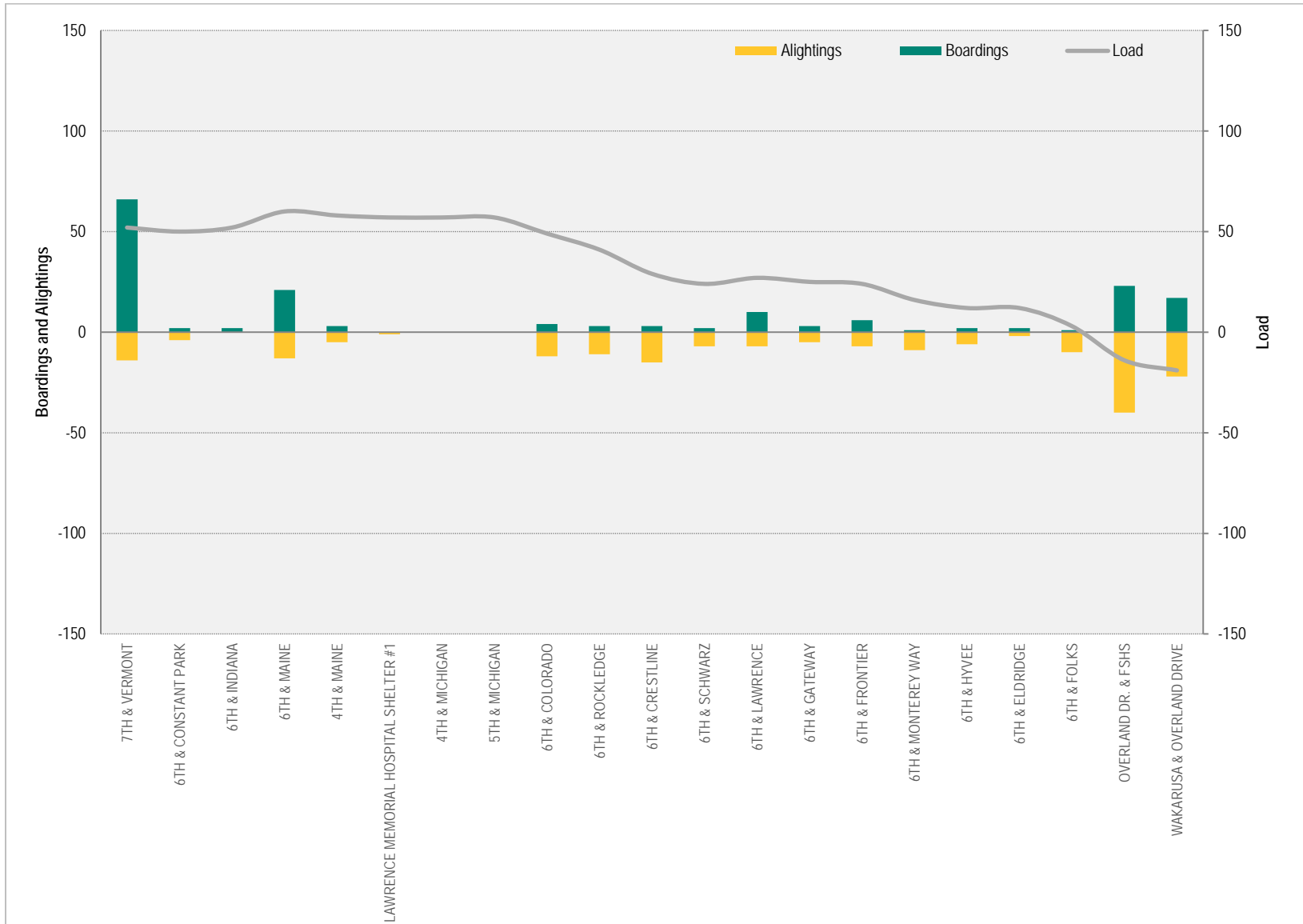
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

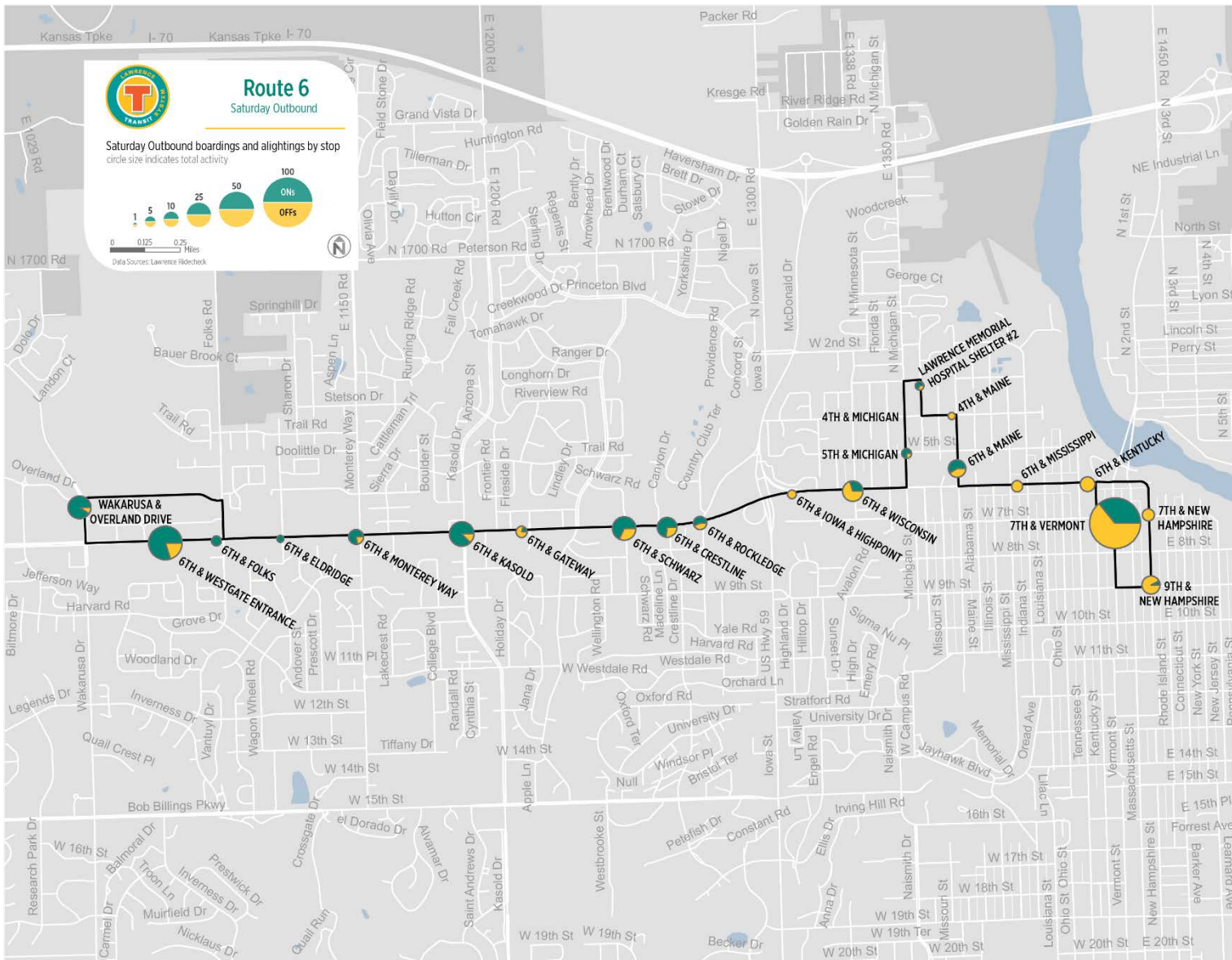
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

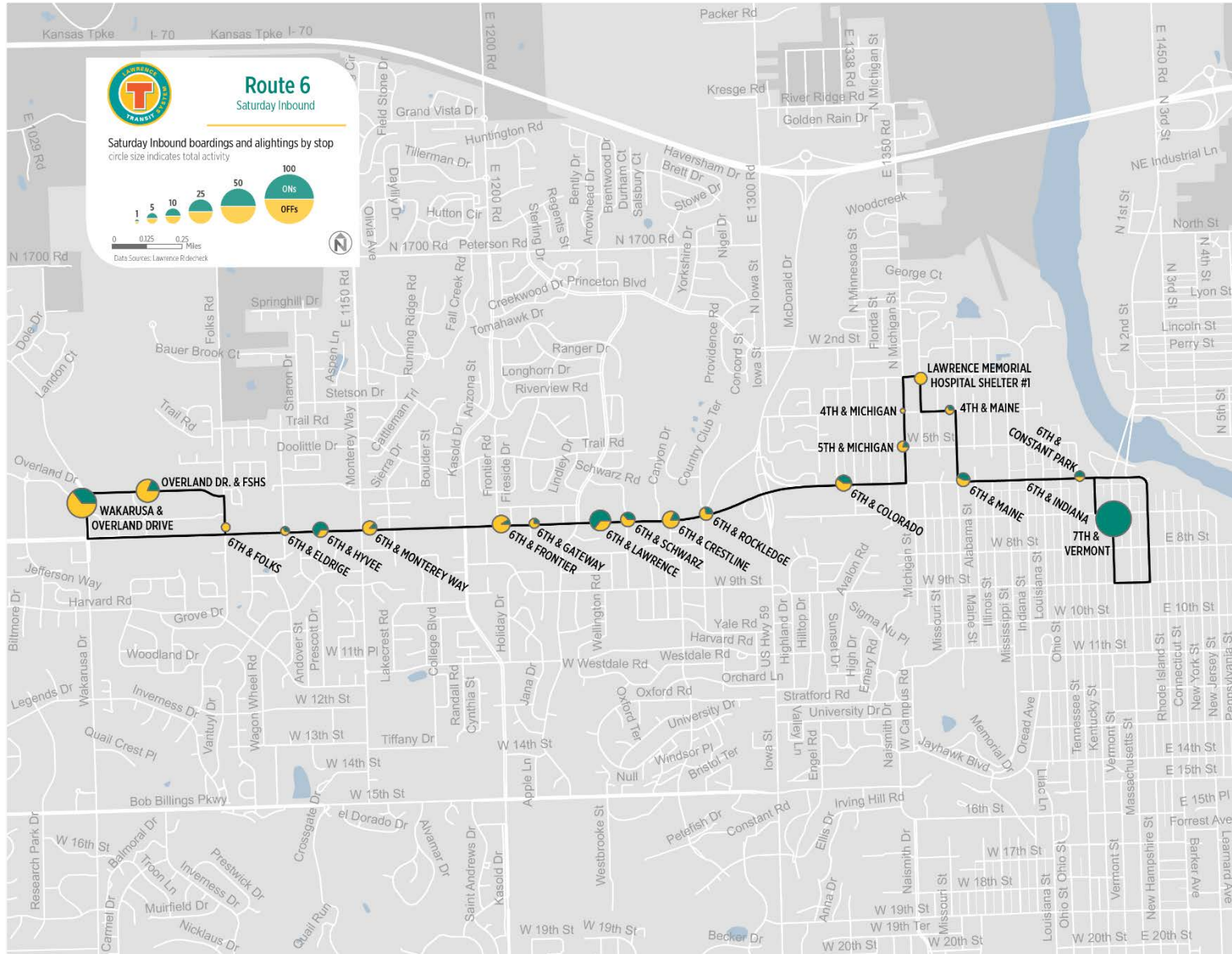
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

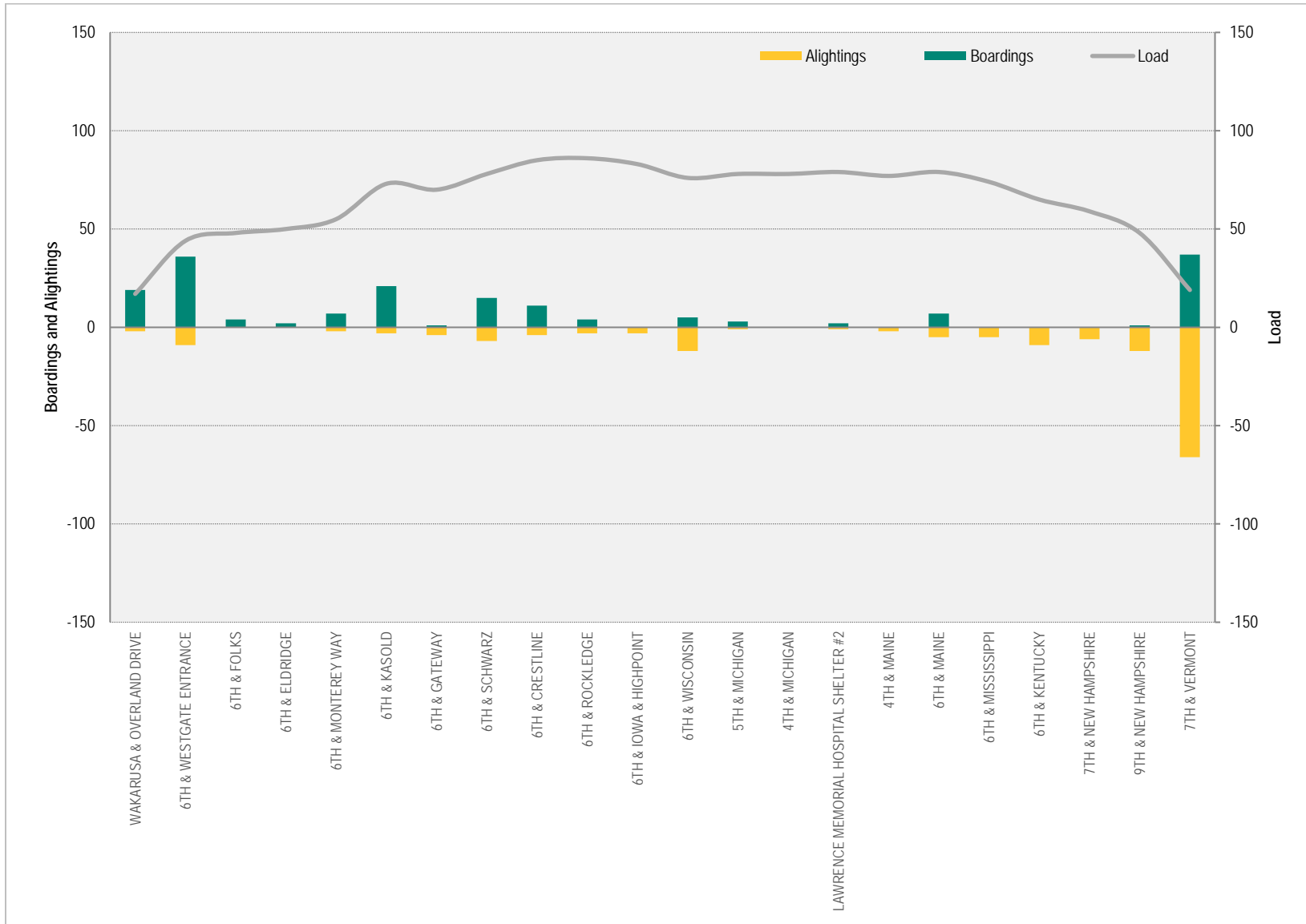
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

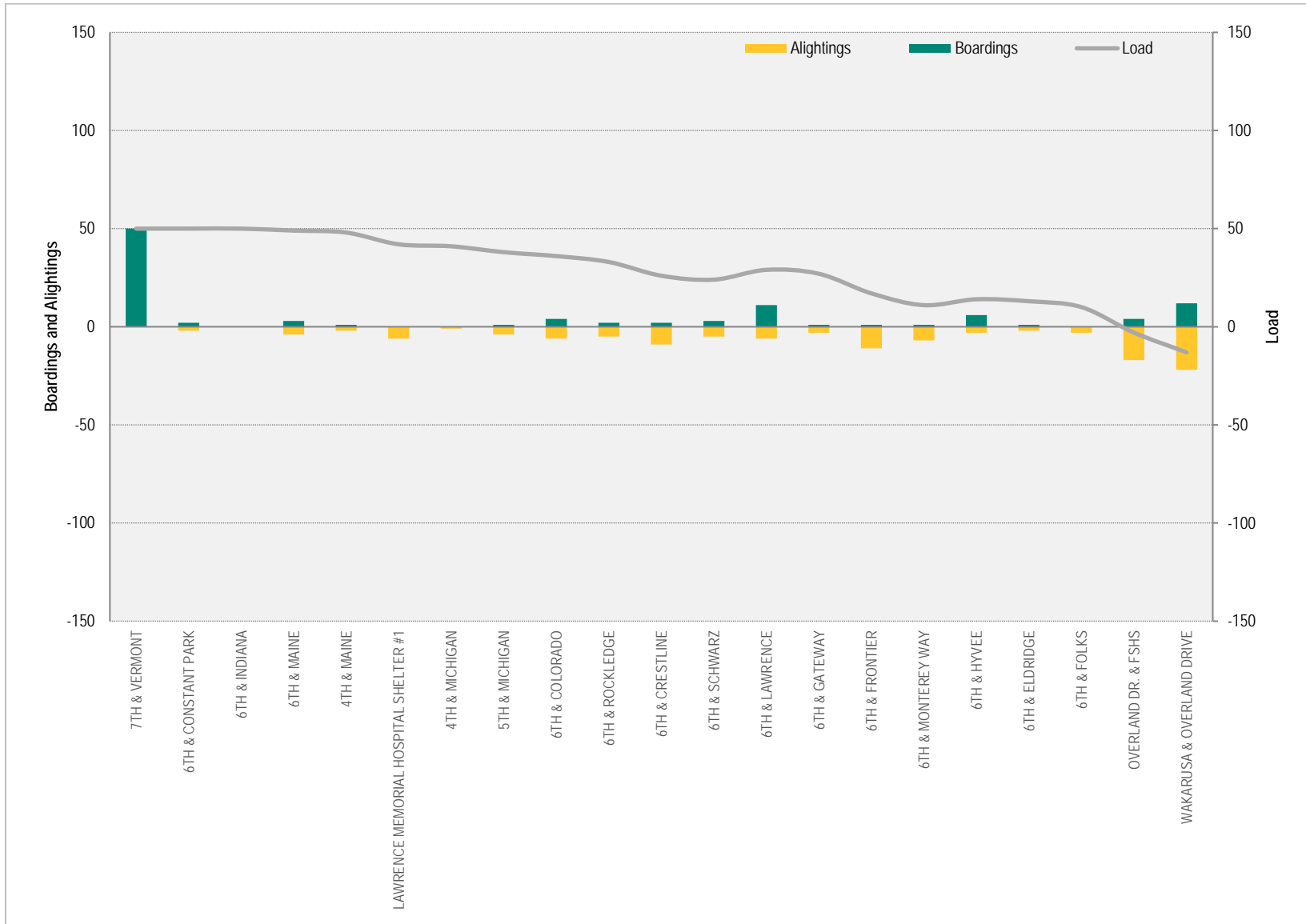
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

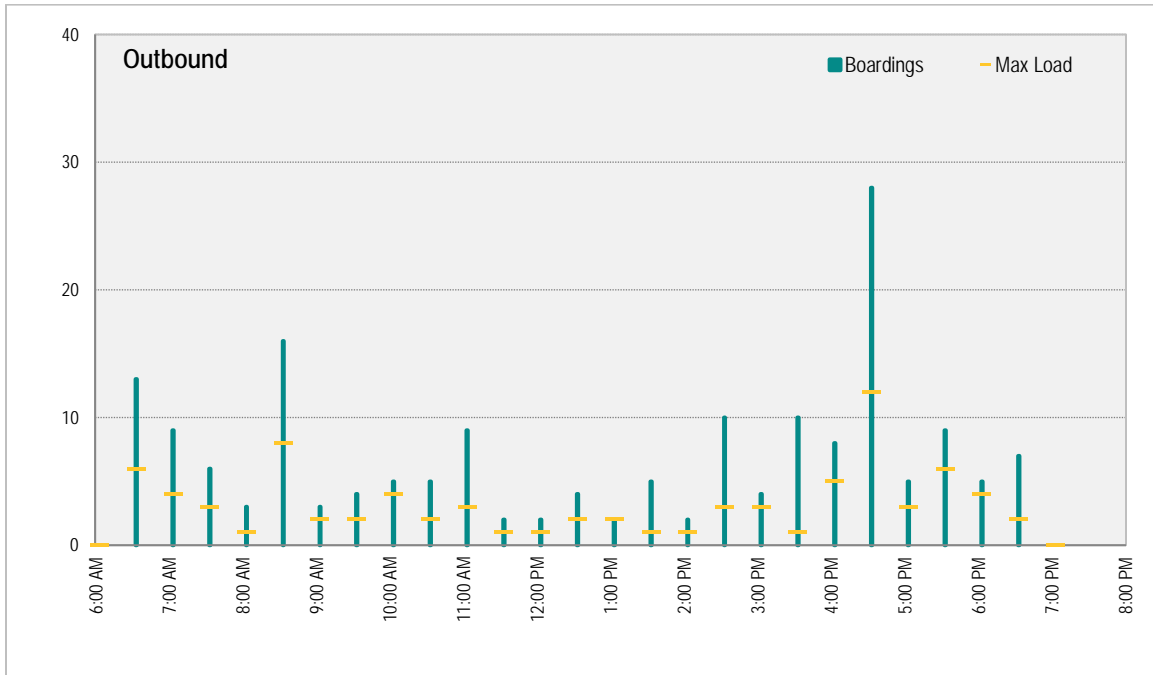
RIDERSHIP BY TRIP

On weekdays, Route 6 ridership is highest during the early morning and late afternoon periods (Figure 18 and Figure 19). Traveling in the outbound direction, ridership peaks at 4:33 PM, at 28 passengers; two morning trips record 13 passengers or more each; no trips between 9:00 AM and 2:00 PM record more than nine passengers. Traveling inbound, ridership peaks at 3:35 PM, carrying 21 passengers. Ridership is also strong from 6:30 to 7:30 AM, with each trip recording between nine and 14 passengers. Five inbound trips carry 10 passengers or more, compared to three outbound trips.

On Saturdays, Route 6 ridership is highest during the midday and evening service periods (Figure 20 and Figure 21). Ridership in the outbound direction peaks at 11:03 AM and 3:33 PM, with 14 passengers on each trip. Three additional trips between 1:30 and 4:33 PM carry a minimum of 10 passengers. Saturday inbound ridership is lower; ridership peaks at 12:35 PM, at 11 passengers.

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

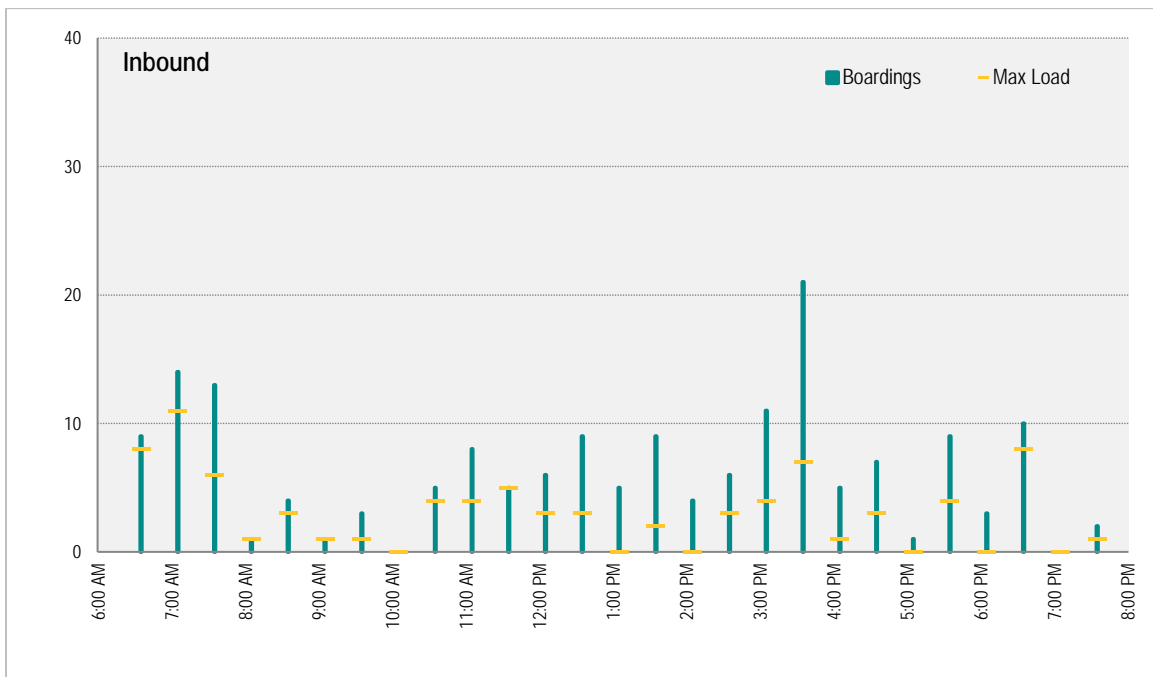
Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart

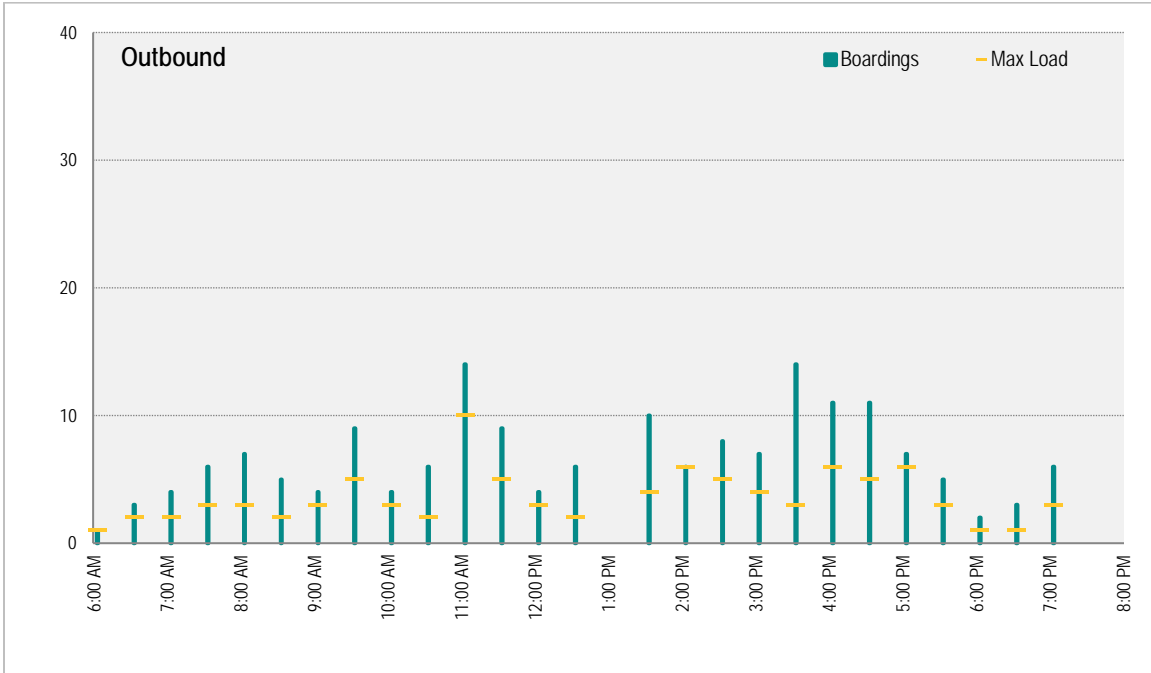


Source: Ride Check, April and May 2016.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

ROUTE EVALUATION | ROUTE 6
Lawrence Transit

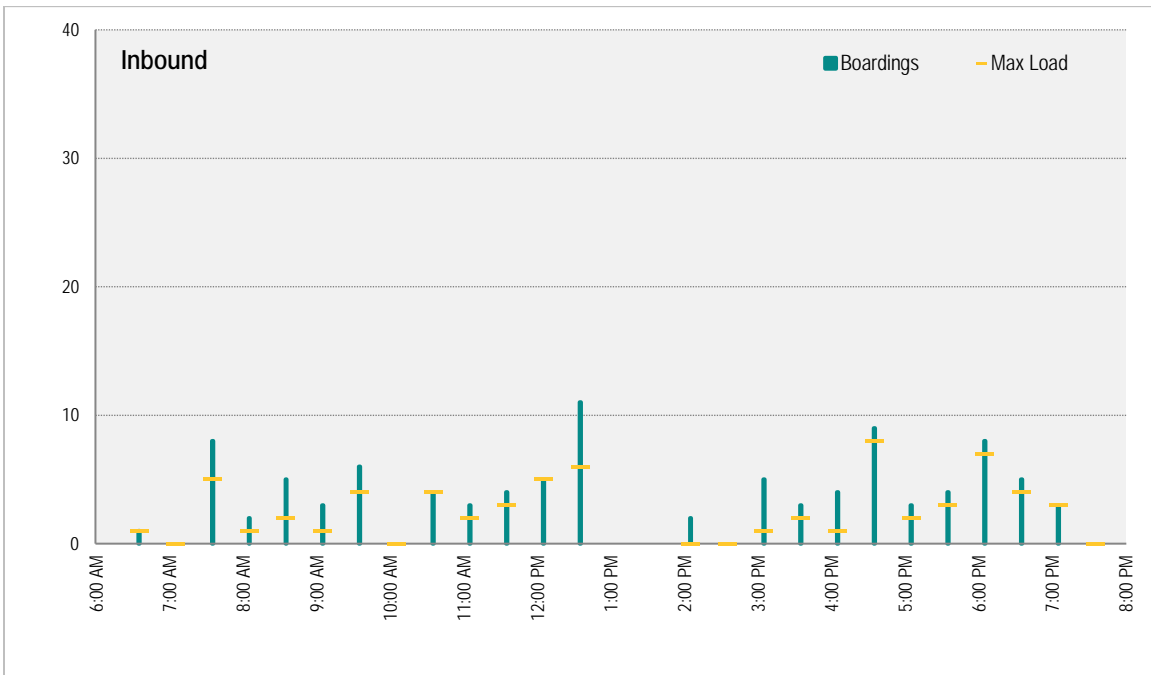
Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: No data recorded for the 1:03 PM trip. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: No data recorded for the 1:05 and 1:35 PM trips. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

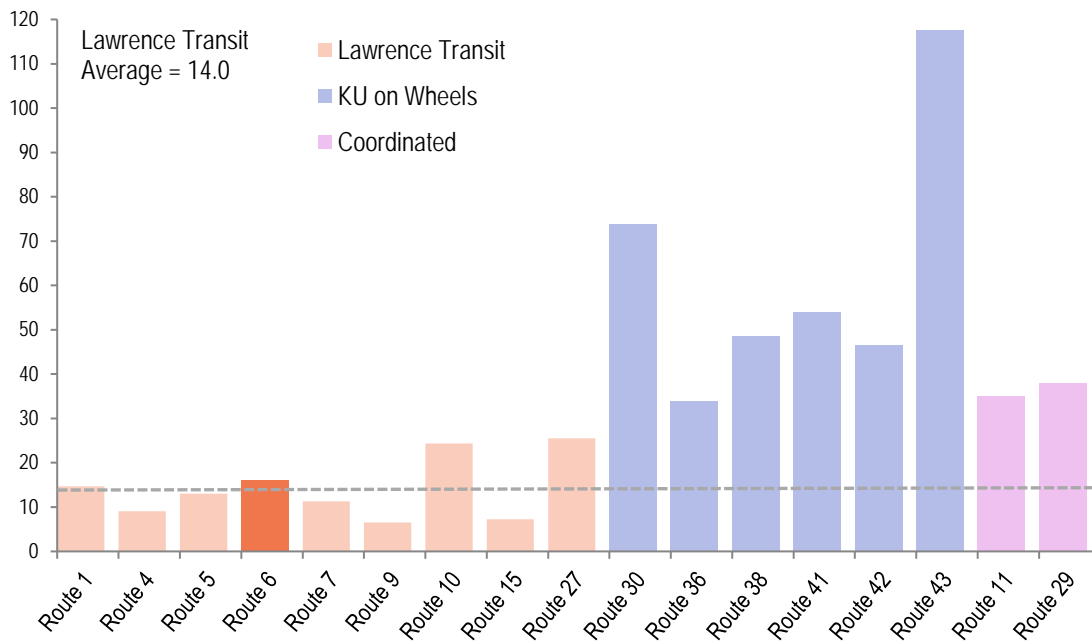
In terms of average passengers per hour, Route 6 is the third most productive Lawrence Transit bus route (Figure 22). The route carries 16.0 passengers per hour on weekdays, exceeding the system average by 14% (Figure 23). Route 6 carries 11.1 passengers per hour on Saturdays (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	429	26.8	16.0	14.0	3 of 9
Saturday	298	26.8	11.1	9.7	3 of 8

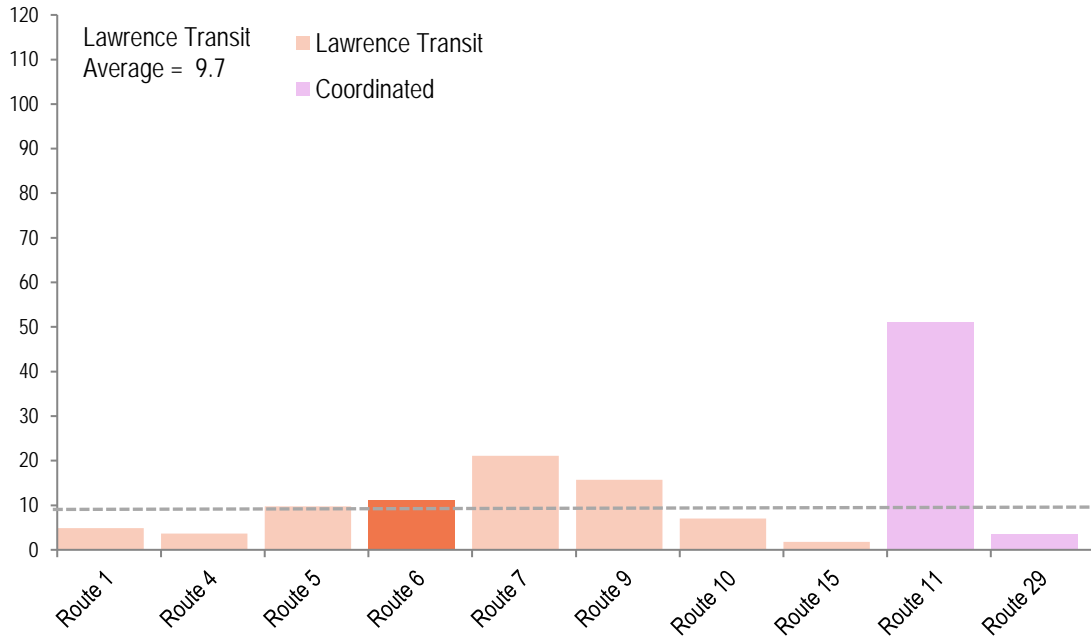
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 50% of Route 6 time points were served “on-time” during the survey period (Figure 25). On Saturdays, approximately 49% of Route 6 time points were served “on-time” during the survey period.” Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by late departures, with over 41% of time points served late. Saturday shows the opposite; on-time performance was almost entirely affected by early departures. Vehicular traffic on weekdays and lower ridership on Saturdays may be responsible for this pattern.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	50.0%	49.4%
Early	8.8%	47.0%
Late	41.2%	3.6%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 6 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Extend Service Closer to Walmart Supercenter.** 6th Street has a mix of uses and good connections between downtown, residential areas, education, city services, and other retail and commercial uses. However, the connection to the Walmart Supercenter can be improved, making access to the bus less cumbersome with full grocery bags. One possible alignment would be for buses traveling west on 6th Street to stay on 6th until Congressional Drive, and then loop around the Walmart in the clockwise direction using Congressional Drive, Overland Drive, and Wakarusa Drive. This would allow for a bus stop on Overland Drive, giving riders closer access to the Walmart. It would also bring the route closer to a large concentration of high-density housing along Congressional Drive and Overland Drive, thus improving the route's ridership potential.
- **Remove Service from Lawrence Memorial Hospital.** Service to the Lawrence Memorial Hospital shows modest ridership and creates a deviation that inconveniences many other riders on the route. The hospital remains an important origin and destination to serve with transit, but Route 6 would benefit from removing the deviation to the hospital. Route 3 may be a better option to serve the hospital if good opportunities to transfer to other routes in the system are created.

As of August 1st, 2016, Route 6 no longer serves the Lawrence Memorial Hospital, operating entirely along 6th Street between downtown and Folks Road.

- **Serve Rock Chalk Park.** Service to Rock Chalk Park on Route 6 would create more useful connections to the park since Route 6 serves downtown directly and a mixed use corridor along 6th Street. Currently, Route 9 service to Rock Chalk Park primarily benefits those who live and work south of Clinton Parkway/23rd Street.

As of August 1st, 2016, Route 6 serves Rock Chalk Park instead of Route 9.

- **Begin Service at 6:33 AM; End Service after the 6:35 PM Departure.** Service on Route 6 currently begins at 6:03 AM and ends at 7:57 PM (last departure at 7:35 PM). Low ridership on departures before 6:33 AM and after 6:35 PM indicate that the resources necessary to operate that service could be better spent elsewhere. As a result, reducing the service span to approximately 6:30 AM to 7:00 PM would benefit users in some other way or on some other part of the system.

Lawrence Transit System

ROUTE 7

Downtown to 31st & Iowa

SERVICE DESIGN

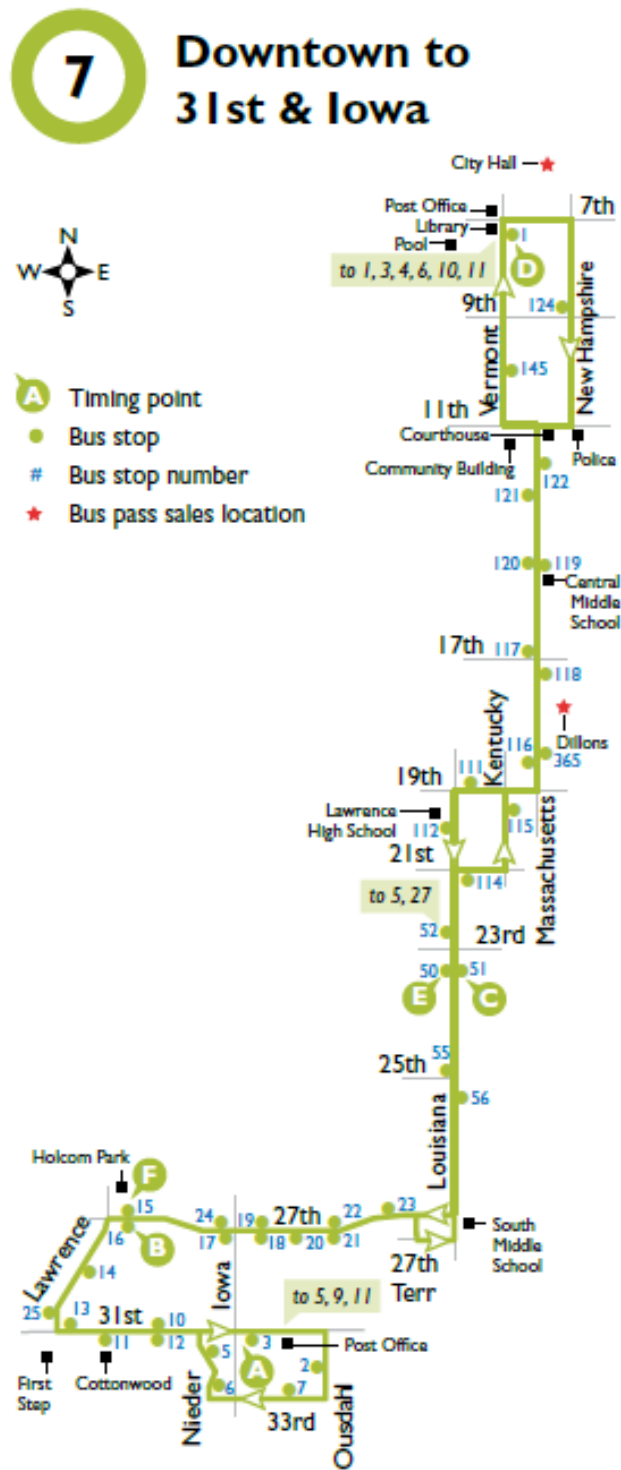
Route 7 is a Lawrence Transit route that operates between the Downtown Transit Hub and Pine Ridge Plaza. The route travels primarily along Massachusetts Street, Louisiana Street, 27th Street, and 31st Street (Figure 1). Route 7 provides service to downtown Lawrence, Lawrence High School, and Pine Ridge Plaza.

ALIGNMENT/SERVICE PATTERNS

Route 7 has one service pattern for weekday and Saturday service. Departing outbound from the intersection of 31st Street and Iowa Street, Route 7 turns right on Ousdahl Road, right on 33rd Street, right on Nieder Road, left on 31st Street, right on Lawrence Avenue, and right on 27th Street. Traveling east on 27th Street, Route 7 then turns right on Belle Haven Drive, left on 27th Terrace, left on Louisiana Street, right on 21st Street, left on Kentucky Street, right on 19th Street, left on Massachusetts Street, left on 11th Street, right on Vermont Street, and terminates at the downtown transit hub.

Returning inbound, Route 7 turns right on 7th Street, right on New Hampshire Street, right on 11th Street, left on Massachusetts Street, right on 19th Street, left on Louisiana Street, right on 27th Street, right on Lawrence Avenue, left on 31st Street, and terminates at the intersection of 31st Street and Iowa Street.

Figure 1 | Route Map



This route operates Monday–Saturday, except holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day

Source: Lawrence Transit, August 2015–July 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 7 and several Lawrence Transit routes at the downtown transit hub and at 31st Street and Iowa Street (Pine Ridge Plaza). There are also transfer opportunities at several other points along the route, including along Louisiana Street (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Downtown Transit Hub	Route 1, Route 3, Route 4, Route 6, Route 10, Route 11, Route 15
Pine Ridge Plaza	Route 5, Route 9, Route 11
23rd Street and Louisiana Street	Route 5, Route 27

SERVICE SCHEDULE

Route 7 operates service Monday-Saturday (Figure 3) year round. On weekdays and Saturdays, the route runs every 30 minutes from 6:02 AM to 8:00 PM. Route 7 does not operate on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:02 AM – 8:00 PM	30	28/28
Saturday	6:02 AM – 8:00 PM	30	28/28
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 7 ranks fourth of nine Lawrence Transit routes in terms of weekday ridership and second of nine in terms of ridership per trip (Figure 4). On average, the route carries 264 passengers, or 9.4 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 7 carries 293 passengers, or 10.5 passengers per trip. Within Lawrence Transit, Route 7 features the second largest increase in average ridership between weekdays and Saturdays (29 passengers).

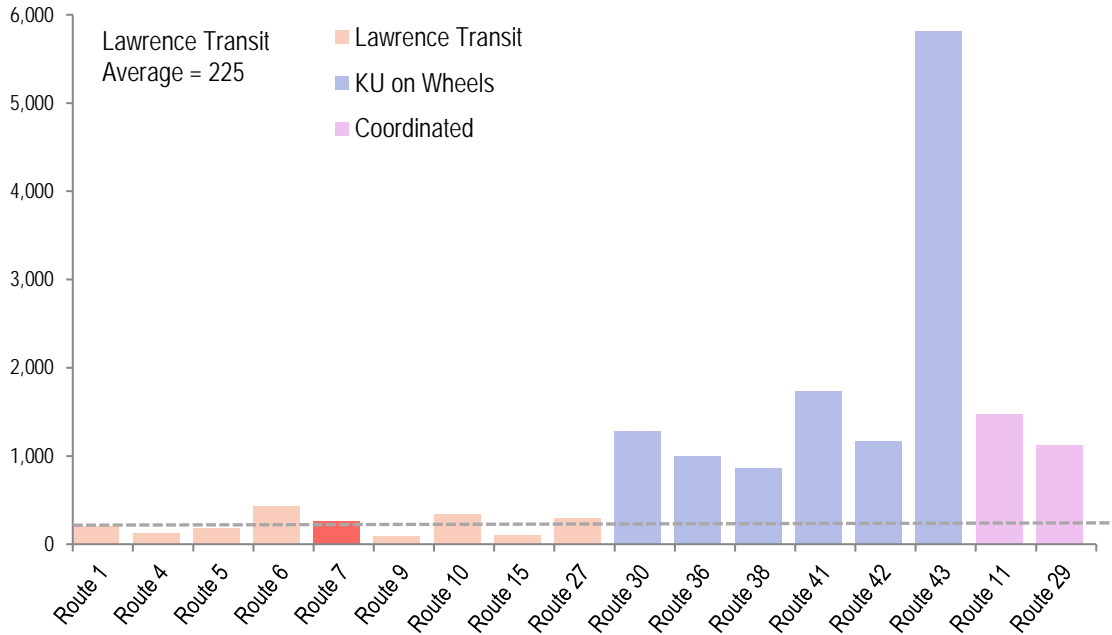
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	264	56	9.4	6.5	2 of 9
Saturday	293	56	10.5	4.7	1 of 8

Source: Lawrence Transit, 2016

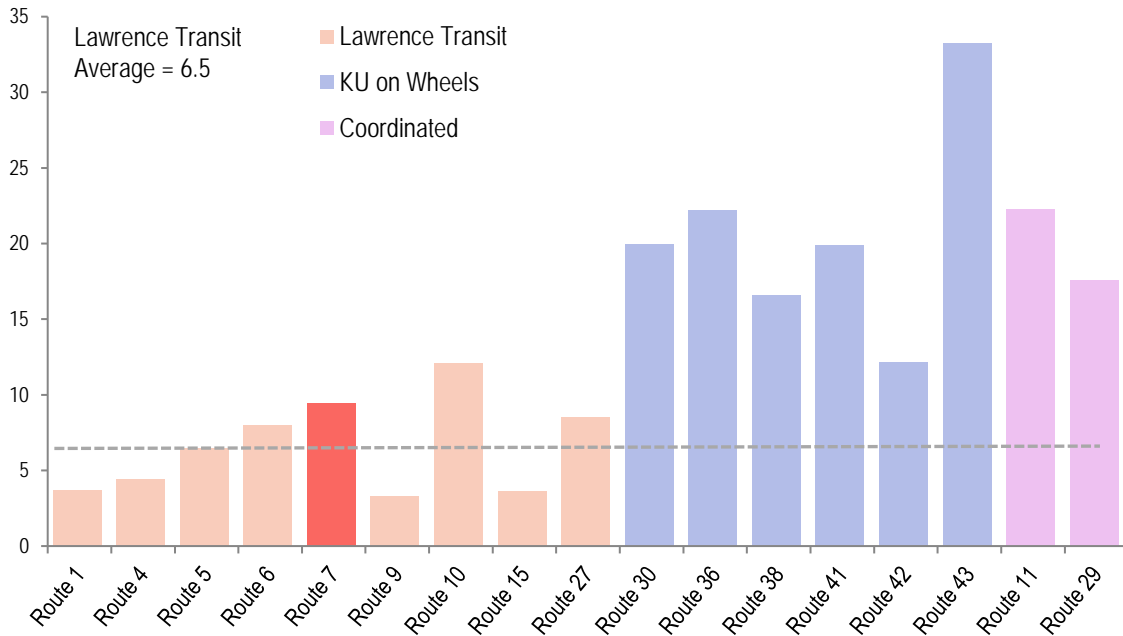
ROUTE EVALUATION | ROUTE 7
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

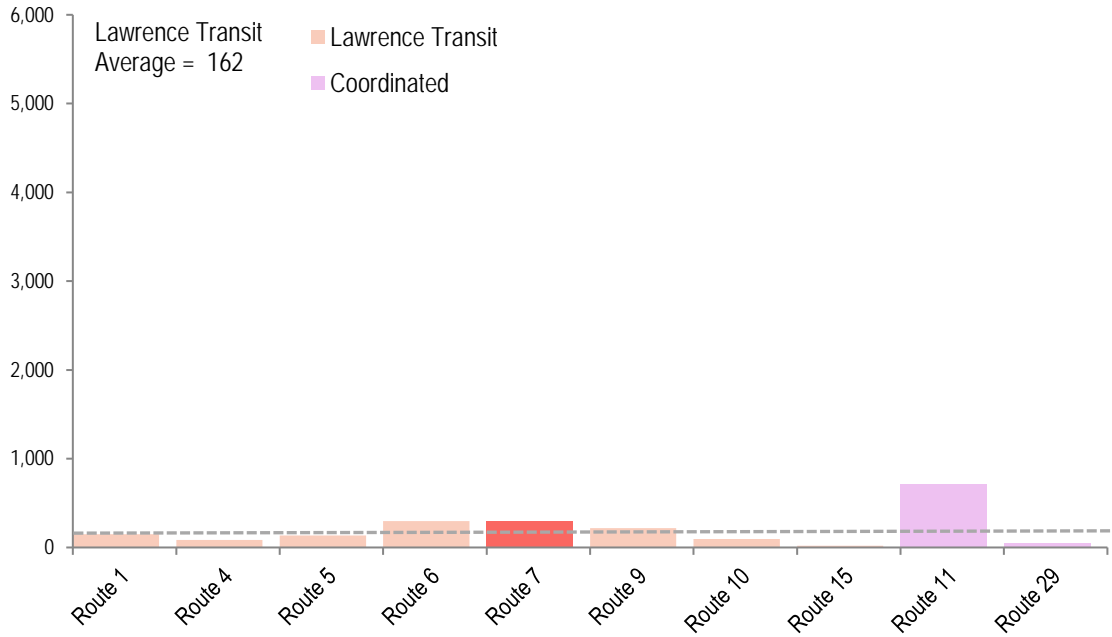
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

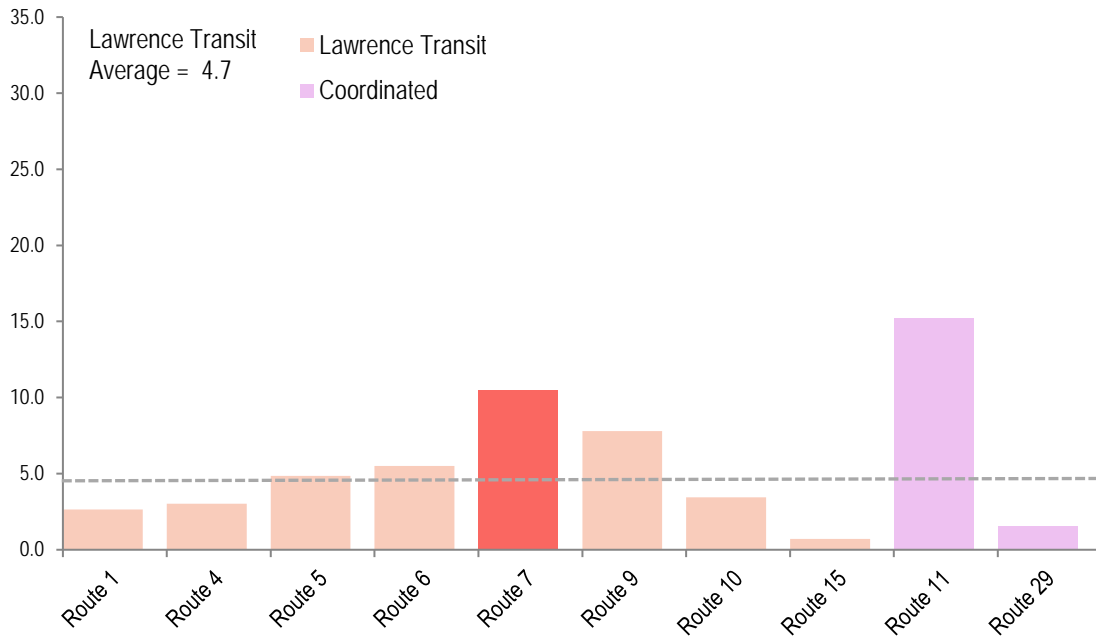
ROUTE EVALUATION | ROUTE 7
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 7 are located near downtown Lawrence, near Pine Ridge Plaza, and near Lawrence High School (Figure 9). Inbound ridership is highest at the terminating stop at 7th Street and Vermont Street in downtown Lawrence, recording 111 alightings.

Other inbound stops with more than 20 combined boardings and alightings per weekday include: Louisiana Street at Checker’s, 33rd Street at Kohl’s, 21st Street at Louisiana Street, 10th Street at Vermont Street, 27th Street at Ousdahl Road, and 31st Street at Iowa Street. These stops primarily serve commercial and retail destinations. All other inbound stops serve fewer than 20 boardings and alightings (Figure 10-Figure 13). Traveling in the outbound direction, the 7th Street at Vermont Street stop generates 77 combined boardings and alightings, the highest among outbound stops.

Saturday ridership patterns are similar to weekday patterns, featuring comparable ridership at multiple stops in both the outbound and inbound directions (Figure 14-Figure 17). Stops in downtown Lawrence, along with the 33rd Street at Kohl’s, Louisiana at Checker’s, and 31st Street at Iowa stops, generate the most combined boardings and alightings.

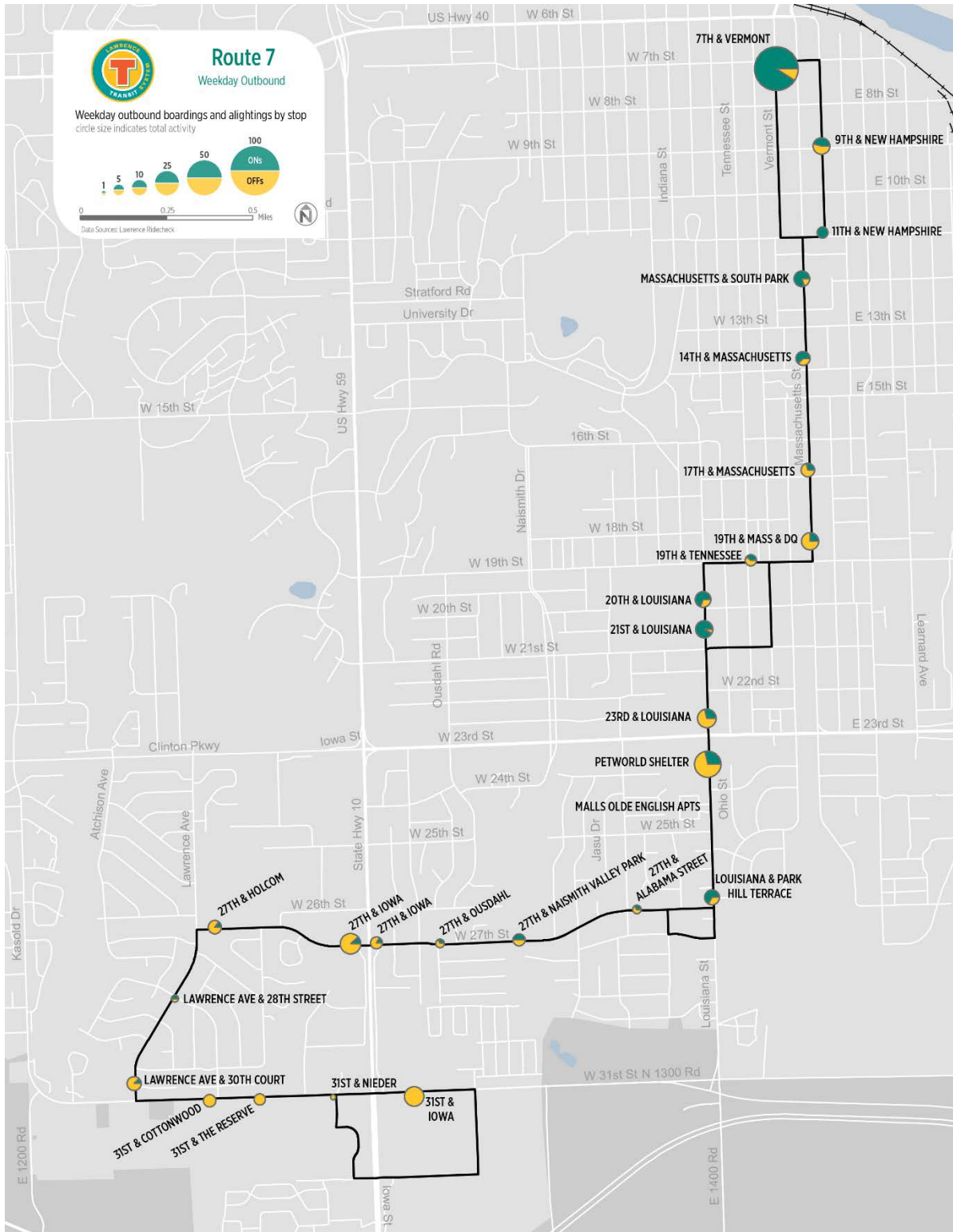
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
7th Street / Vermont Street	111	Downtown Lawrence; Lawrence Public Library; City Hall
Louisiana Street / Checker’s	36	Checker’s; The Malls Shopping Center
33rd Street / Kohl’s	23	Pine Ridge Plaza; multiple local and national retail stores
21st Street / Louisiana Street	24	Lawrence High School; residential neighborhoods
10th Street / Vermont Street	22	Downtown Lawrence; Lawrence Arts Center

*Weekday outbound ridership (boardings and alightings) for Route 7 only.

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

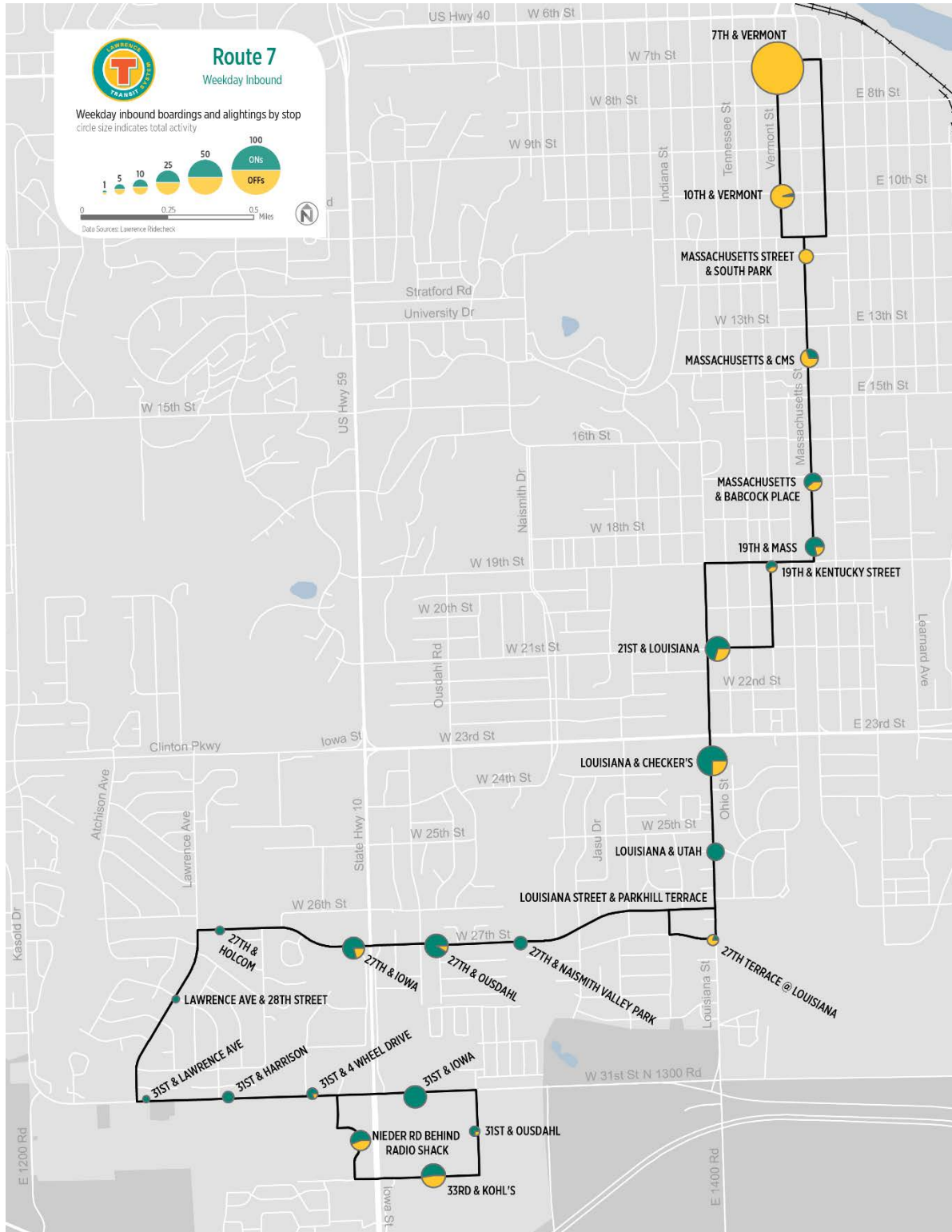
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

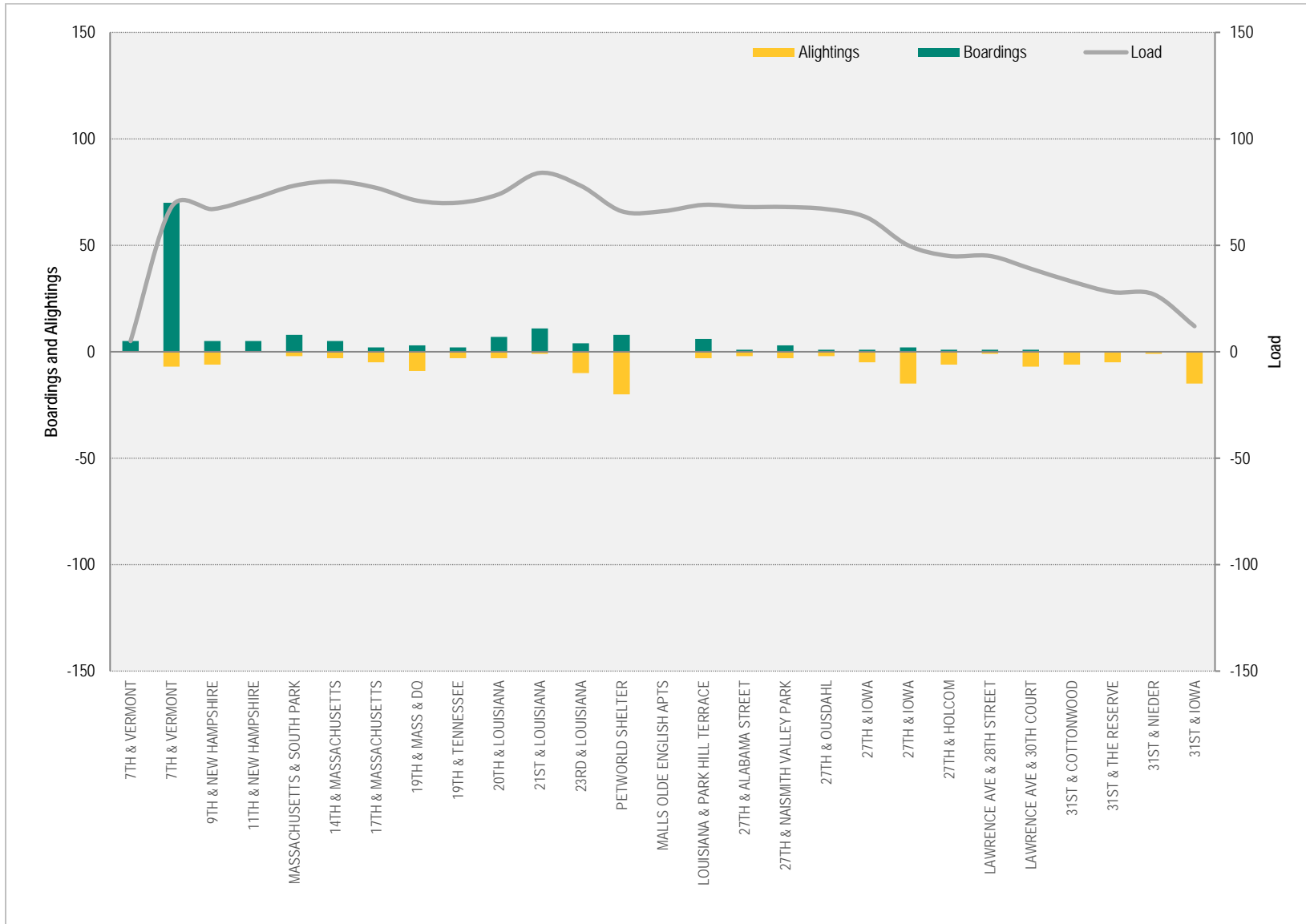
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

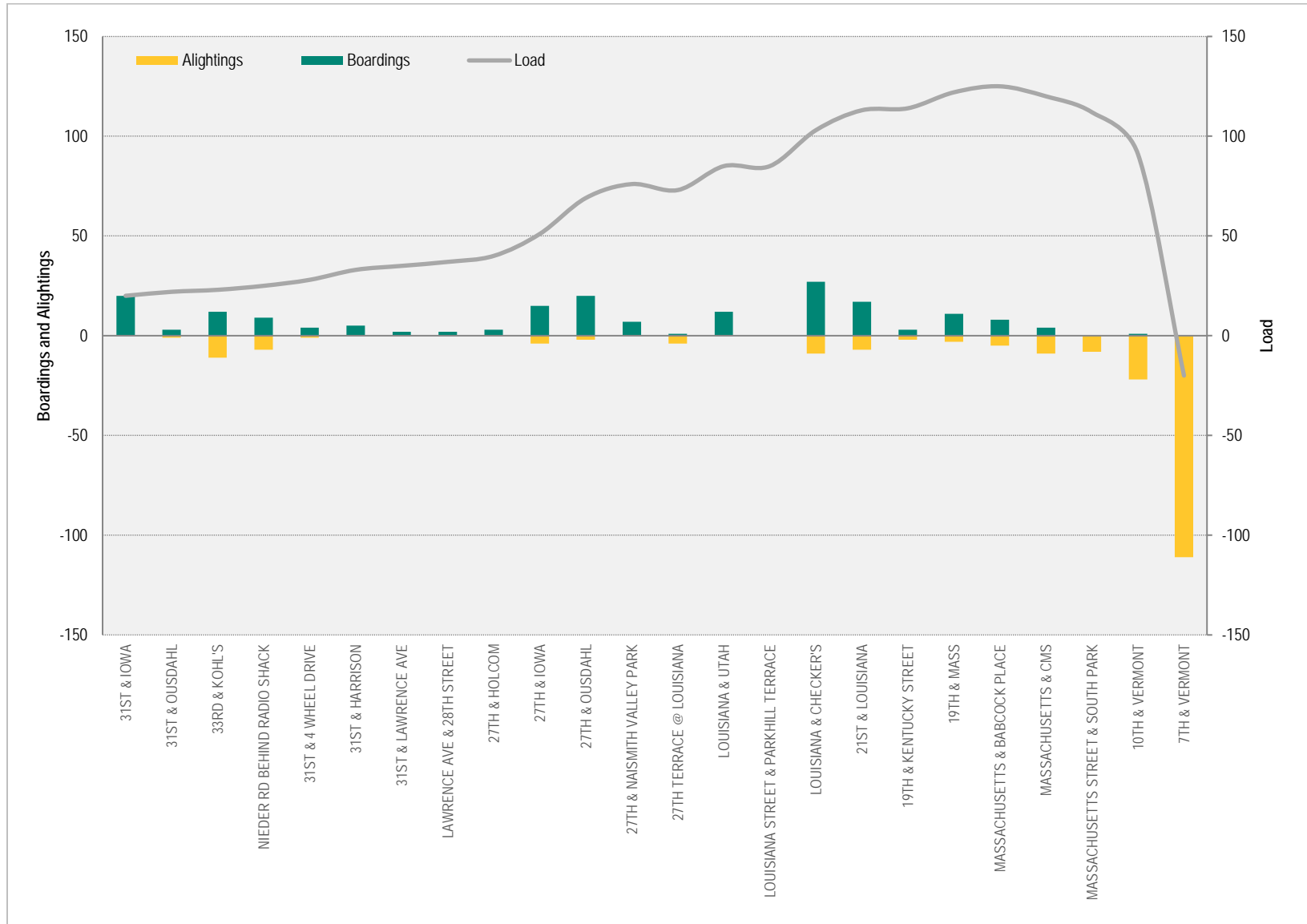
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

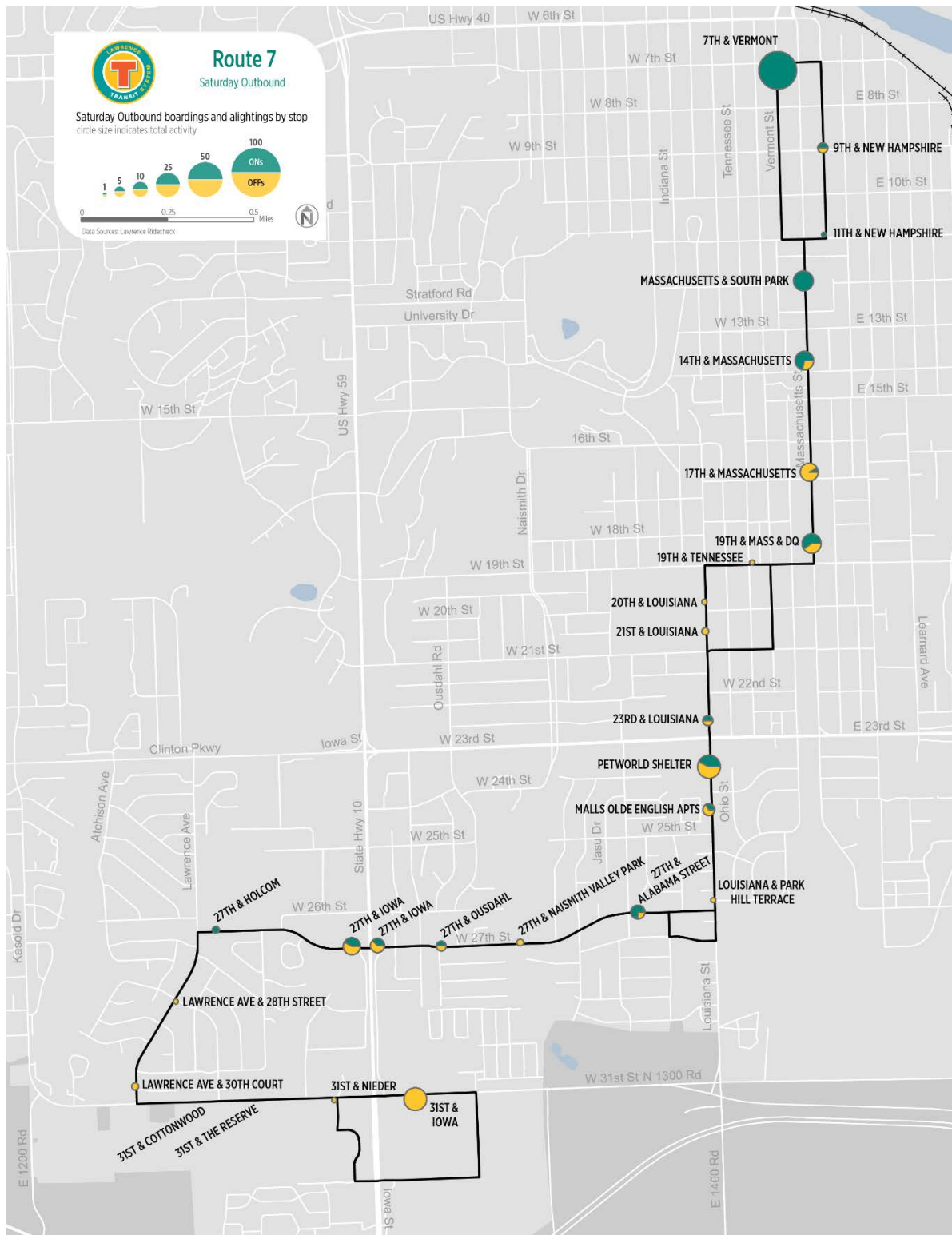
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

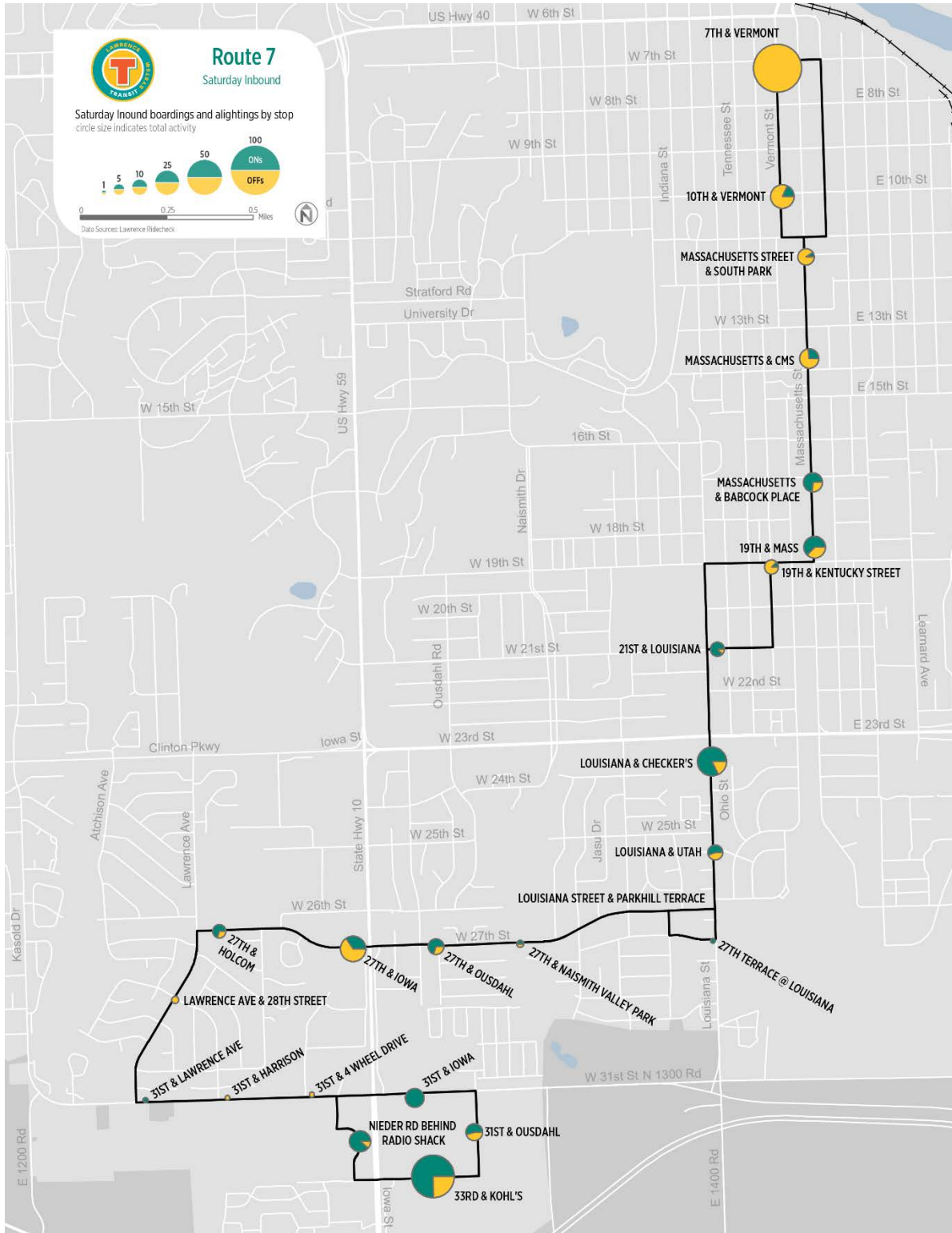
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

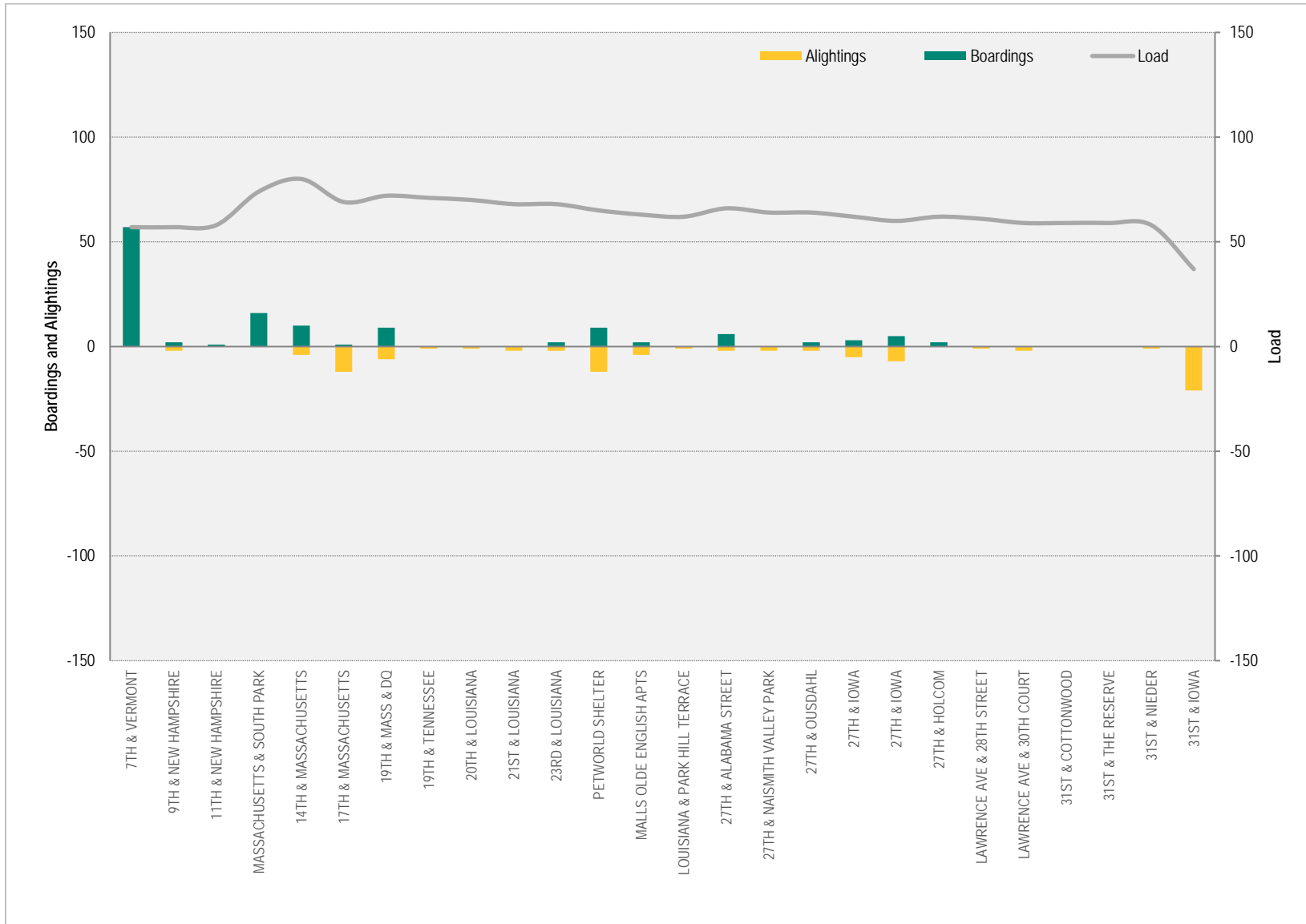
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

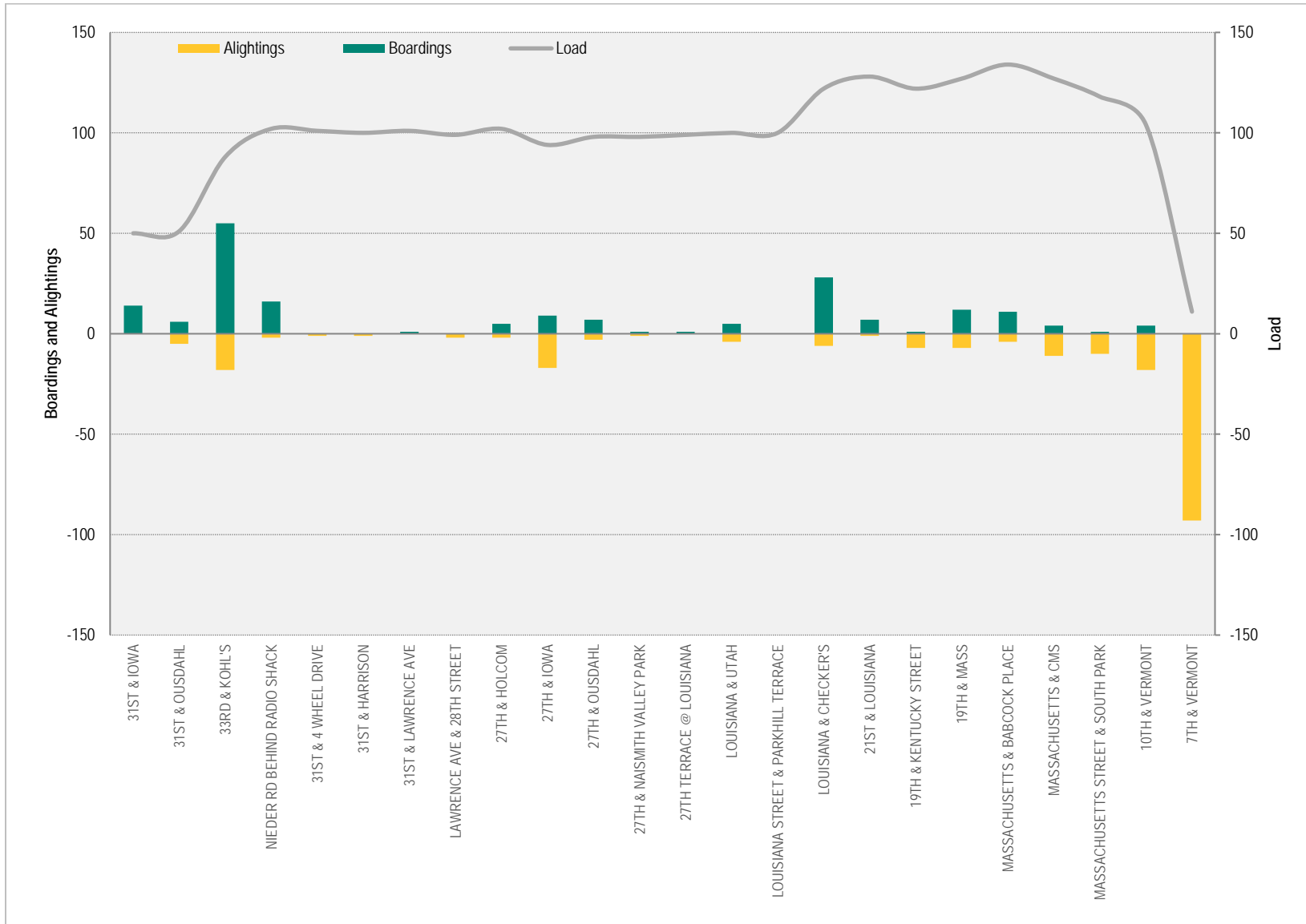
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

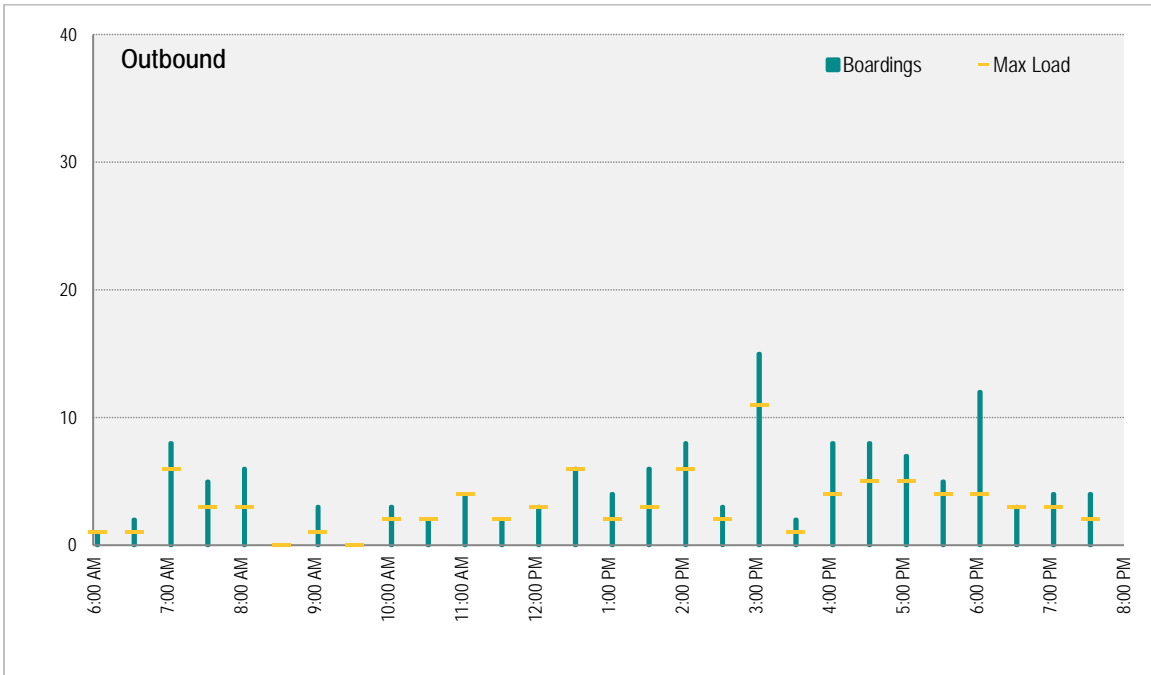
RIDERSHIP BY TRIP

On weekdays, Route 7 ridership peaks at 7:30 AM in the inbound direction with 16 boardings. Ridership traveling inbound remains steady throughout the day, with seven trips carrying 10 passengers or more. Traveling outbound, ridership is highest at 3:00 PM (15 boardings) and between 4:00 and 6:03 PM. During this period, outbound trips average eight passengers (Figure 18 and Figure 19).

On Saturdays, Route 7 ridership is highest in the outbound direction between 5:00 and 6:00 PM, averaging eight passengers per trip. Ridership is highest in the inbound direction from 2:00 to 3:00 PM, peaking at 18 boardings. Seven Saturday inbound trips carry 10 passengers or more, while only two outbound trips reach this level (Figure 20 and Figure 21).

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

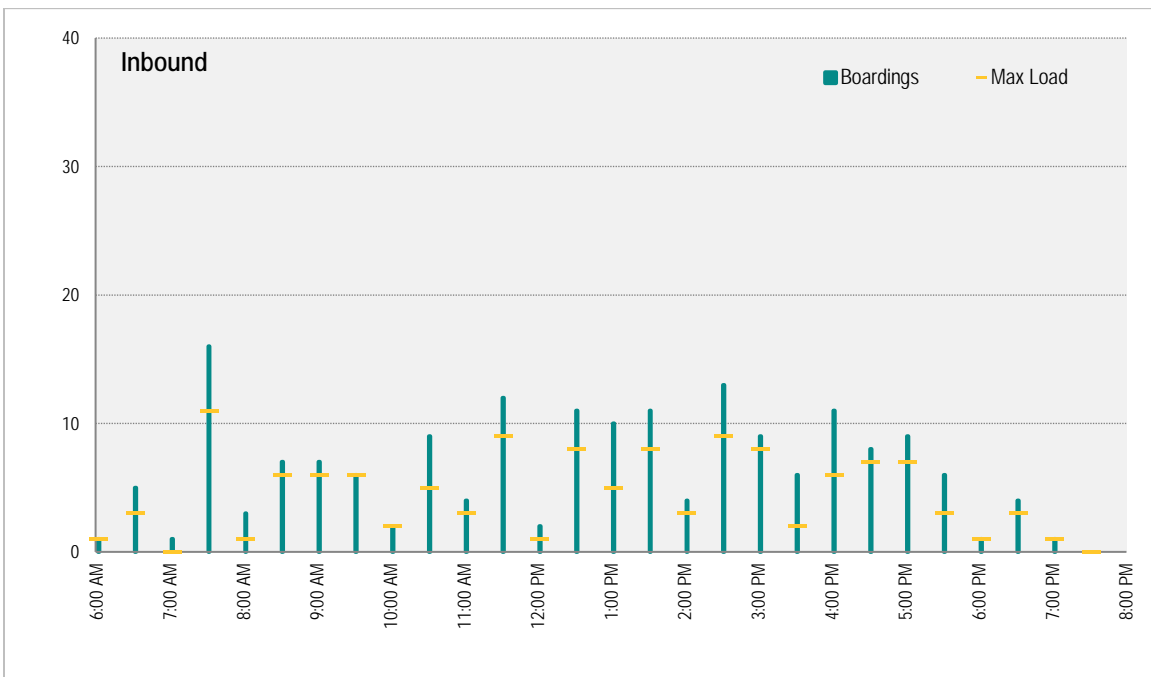
Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart

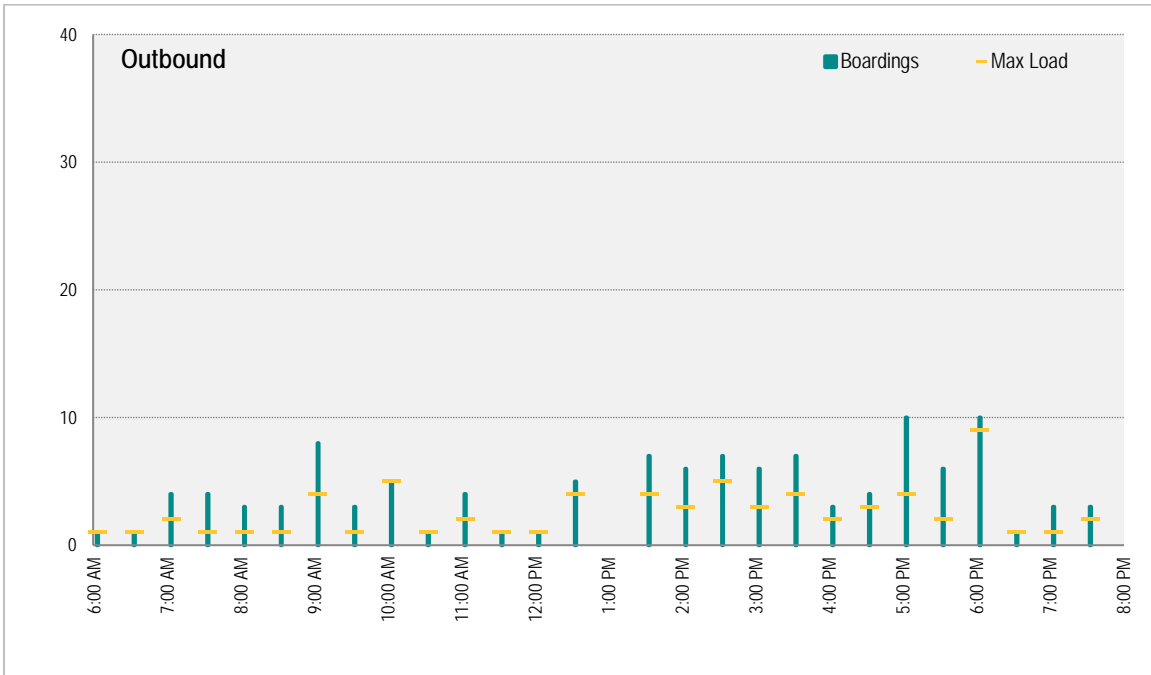


Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

ROUTE EVALUATION | ROUTE 7
Lawrence Transit

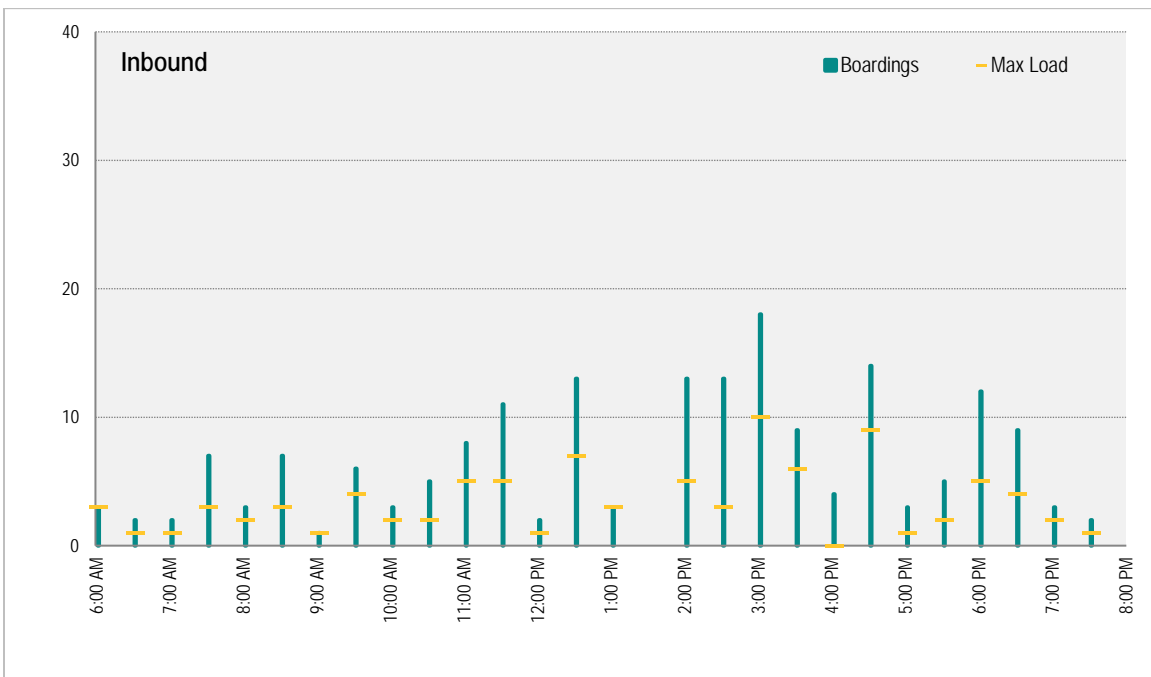
Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 1:03 PM outbound trip.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

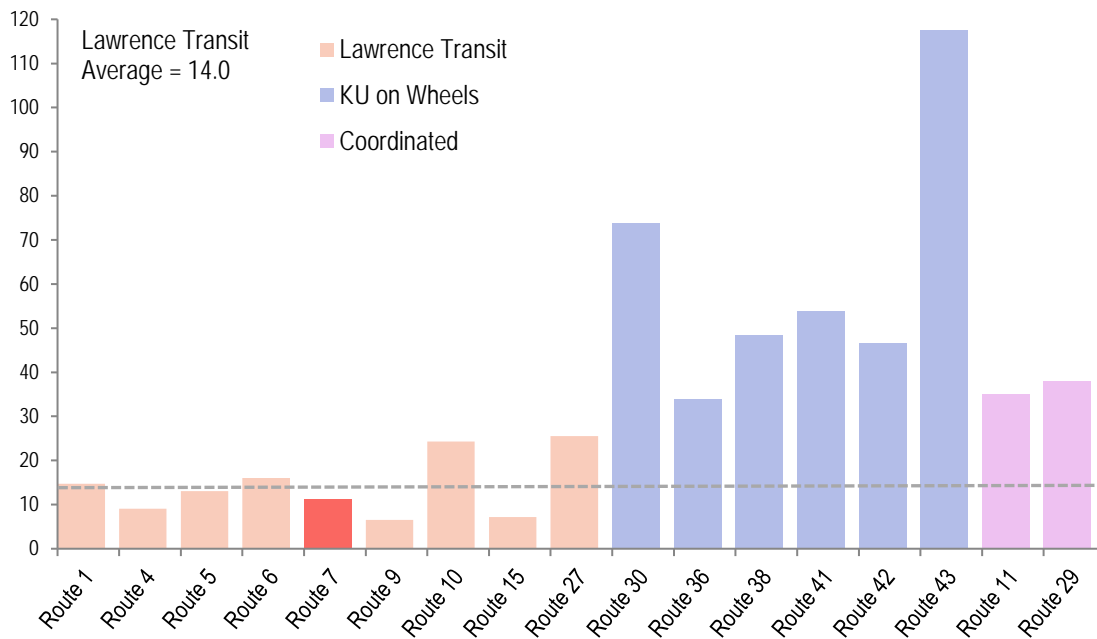
In terms of average passengers per hour, Route 7 is the sixth most productive Lawrence Transit bus route (Figure 22). The route carries 11.3 passengers per hour on weekdays, 19% less than the system average (Figure 23). Route 7 carries 12.6 passengers per hour on Saturdays, and is one of two routes that carries more passengers per hour on Saturdays than on weekdays (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	264	23.3	11.3	14.0	6 of 9
Saturday	293	23.3	12.6	9.7	2 of 8

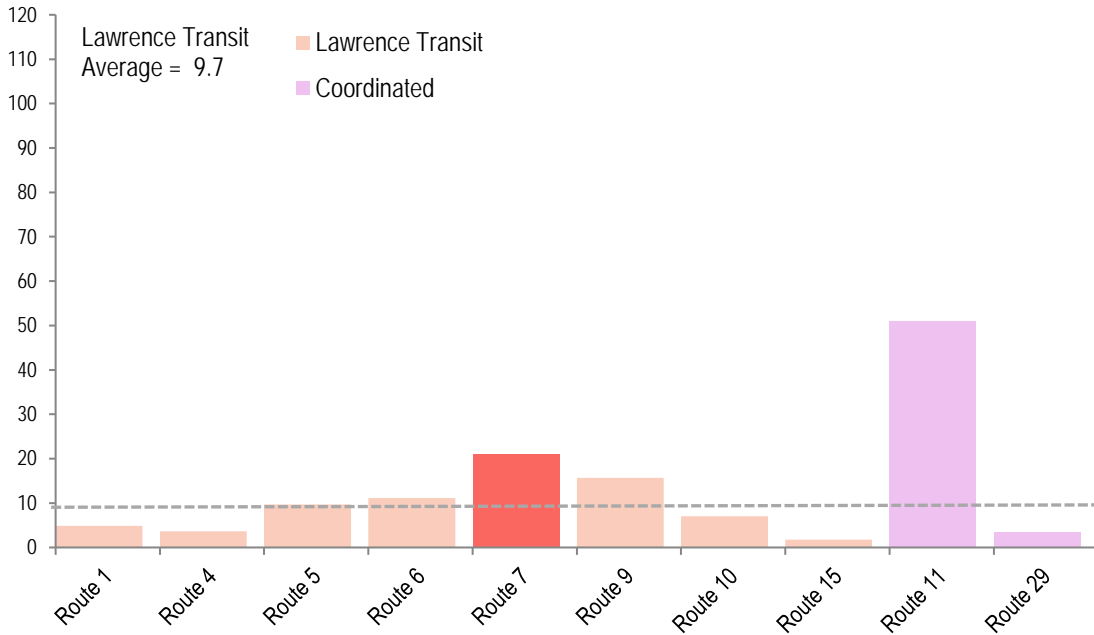
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 55% of Route 7 time points were served “on-time” during the survey period (Figure 25). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule. On Saturdays, approximately 45% of Route 7 time points were served “on-time” during the survey period.

Weekday and Saturday on-time performance was affected by a high rate of early departures, with nearly 28% of weekday trips and 29% of Saturday trips departing stops before scheduled. Approximately 18% of weekday time points were served late, along with nearly 26% of Saturday time points.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	54.6%	45.1%
Early	27.7%	29.3%
Late	17.7%	25.6%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 7 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Reduce Unproductive Deviations.** Currently, Route 7 has different inbound and outbound alignments near Lawrence High School and South Middle School. The deviation at LHS is the result of a poorly designed intersection at 19th Street and Louisiana Street that does not allow for right hand turns; the deviation to South Middle School will be eliminated in August 2016. In both cases, ridership is minimal in the route segments that deviate from the major arterial streets. Operating along consistent alignments in both directions will simplify the route and provide better service for riders who are currently served in one direction only. Given that there are no major ridership generators that justify either deviation, ridership may actually increase if the service is simplified, even if coverage area is slightly reduced.
- **Eliminate service to Lawrence Avenue.** Route 7's lowest sustained ridership, by stop, occurs at the five successive stops on 27th Street (west of Iowa Street), Lawrence Avenue, and 31st Street (west of Iowa Street). On outbound weekday service, these five stops average approximately six combined boardings and alightings. On inbound weekday trips, these five stops average only three combined boardings and alightings. Shifting Route 7 from Lawrence Avenue to Iowa Street would provide a faster, more direct service between downtown and the retail areas. There may be opportunities to serve Lawrence Avenue more effectively with a Lawrence Transit route that operates between south Lawrence and west Lawrence, rather than one serving downtown.

Lawrence Transit System

ROUTE 9

31st & Iowa to 6th & Wakarusa

SERVICE DESIGN

Route 9 is a Lawrence Transit route that operates between Rock Chalk Park and Pine Ridge Plaza. The route travels primarily along Overland Drive, Wakarusa Drive, Kasold Drive, and 31st Street (Figure 1). Route 9 provides service to the 6th Street Walmart Supercenter, Free State High School, Bauer Farm Shopping Center, Dillions, Lawrence Social Security Office, Hy-Vee, Target, Iowa Street Walmart Supercenter, and 31st Street US Post Office.

ALIGNMENT/SERVICE PATTERNS

Route 9 has one primary service pattern for weekday and Saturday service. Departing outbound from Rock Chalk Park, Route 9 turns left on Rock Chalk Drive, right on George Williams Way, left on Overland Drive, right on Wakarusa Drive, straight onto 27th Street, left on Inverness Drive, right on 24th Place, left on Crossgate Drive, right on Clinton Parkway, right on Kasold Drive, straight onto 31st Street, and then terminates outside of Pine Ridge Plaza near the intersection of 31st Street and Iowa Street.

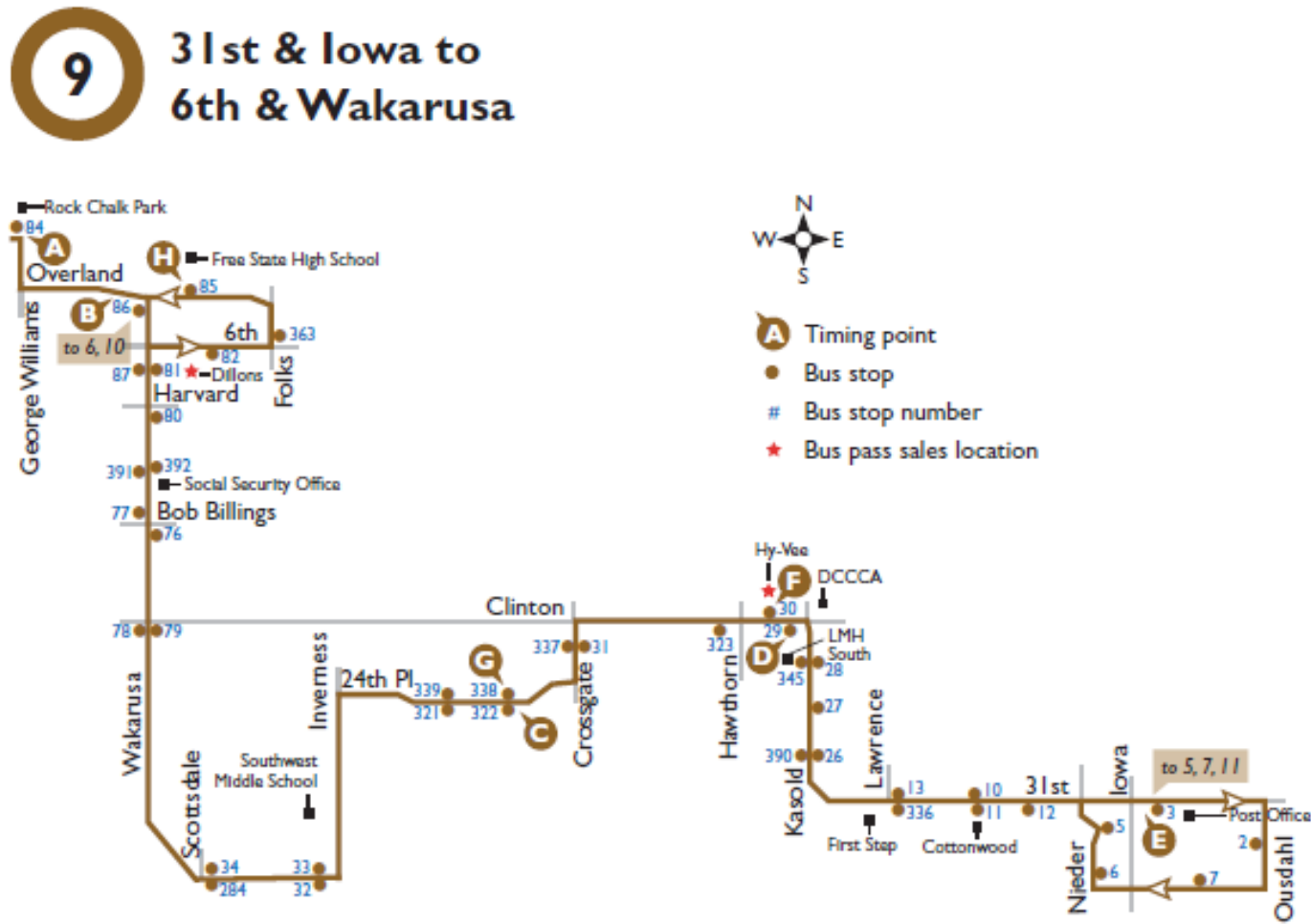
Returning inbound from Pine Ridge Plaza, Route 9 completes a turnaround loop by turning right on Ousdahl Road, right on 33rd Street, right on Nieder Road, and left to return to 31st Street. The route then continues along the outbound alignment until the intersection of 6th Street and Wakarusa Drive. Route 9 inbound service then turns right on 6th Street, left on Folks Road, left on Overland Drive, crosses Wakarusa Drive, and continues along the outbound alignment to Rock Chalk Park

On weekdays, the first outbound trip begins at the intersection of 6th Street and Wakarusa Drive, rather than at Rock Chalk Park, and then continues towards Pine Ridge Plaza along the regular alignment.

As of August 1, 2016, Route 6 now operates service to Rock Chalk Park instead of Route 9.

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 1 | Route Map



Source: Lawrence Transit; August 2015 – September 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 9 and several Lawrence Transit routes and routes that are coordinated with KU on Wheels at 6th Street and Wakarusa Drive and at 31st Street and Iowa Street. There are also transfer opportunities at several other points along the route, including on Wakarusa Drive (Route 10), 6th Street (Route 6 and 10), 27th Street (Route 29), and on sections of 31st Street and 33rd Street (Route 5, 7, and 11) (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Wakarusa Drive and Overland Drive	Route 6 and Route 10
31 st Street and Iowa Street	Route 5, Route 7, Route 11
24 th Place	Route 29

SERVICE SCHEDULE

Route 9 operates Monday–Saturday year round (Figure 3). On both weekdays and Saturdays, the route runs every 60 minutes from 6:05 AM to 6:10 PM. Route 9 does not run on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday–Friday	6:05 AM – 8:00 PM	60	14/14
Saturday	6:05 AM – 8:00 PM	60	14/14
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 9 ranks ninth of nine Lawrence Transit routes in terms of weekday ridership and ninth of nine in terms of ridership per trip (Figure 4). On average, the route carries 91 passengers, or 3.3 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 9 carries 218 passengers, or 7.8 passengers per trip (Figure 7 and Figure 8). Route 9 is one of two Lawrence Transit routes that features higher ridership on Saturdays than on weekdays.

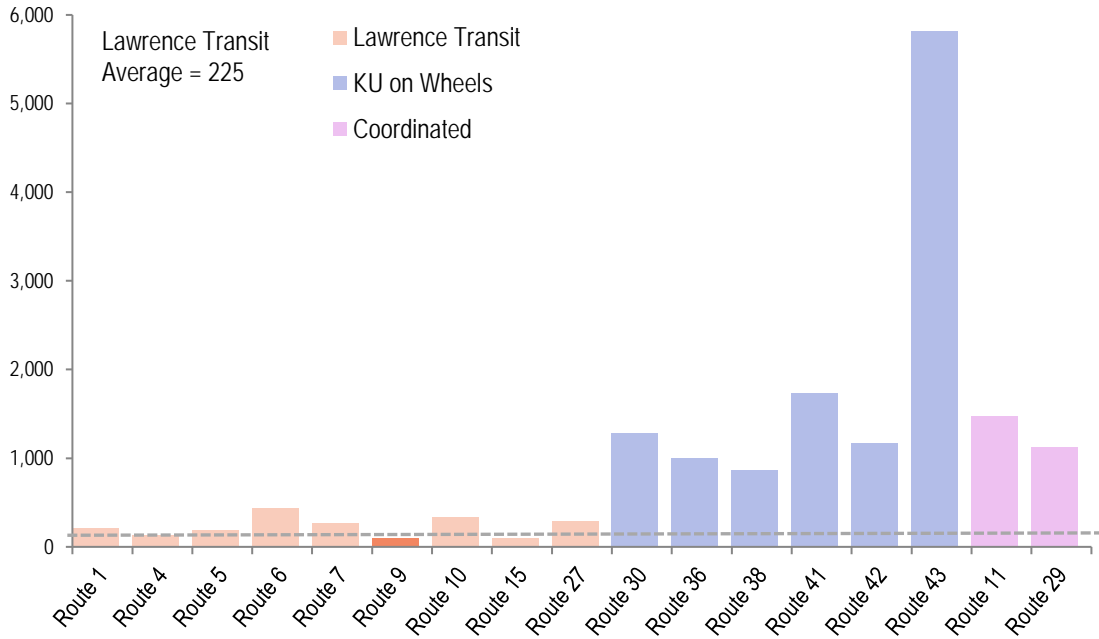
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	91	28	3.3	6.5	9 of 9
Saturday	218	28	7.8	4.7	2 of 8

Source: Lawrence Transit, 2016

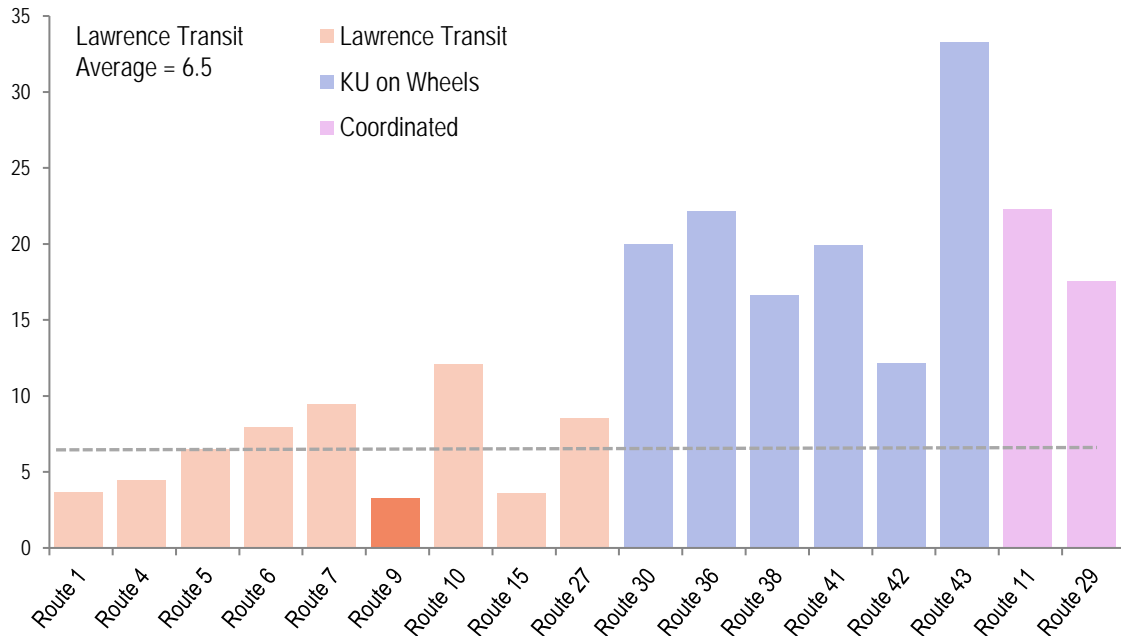
ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

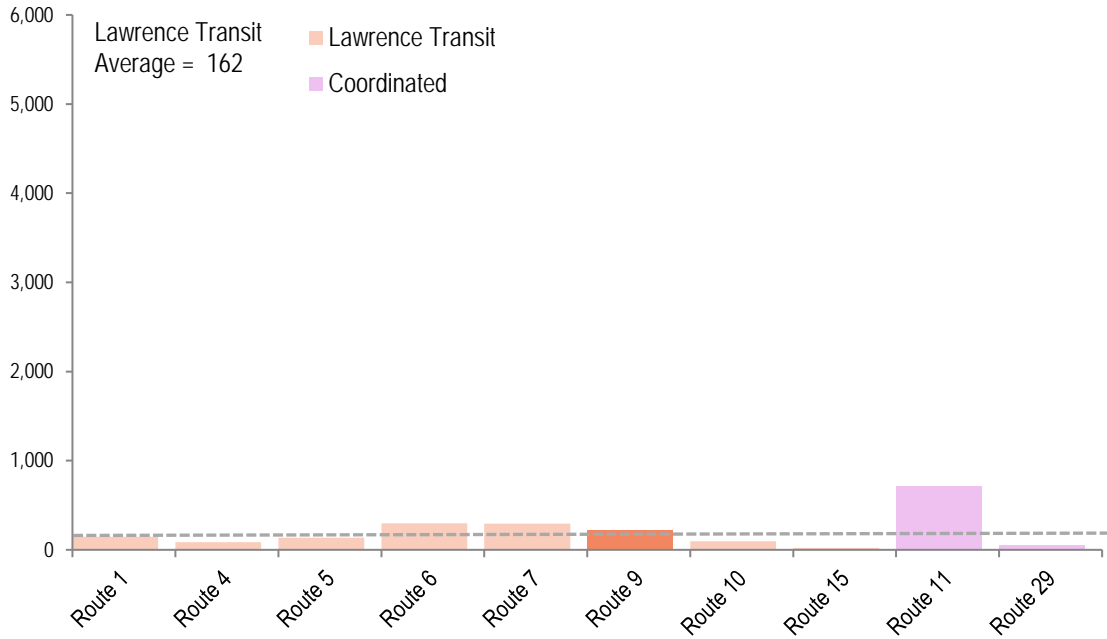
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

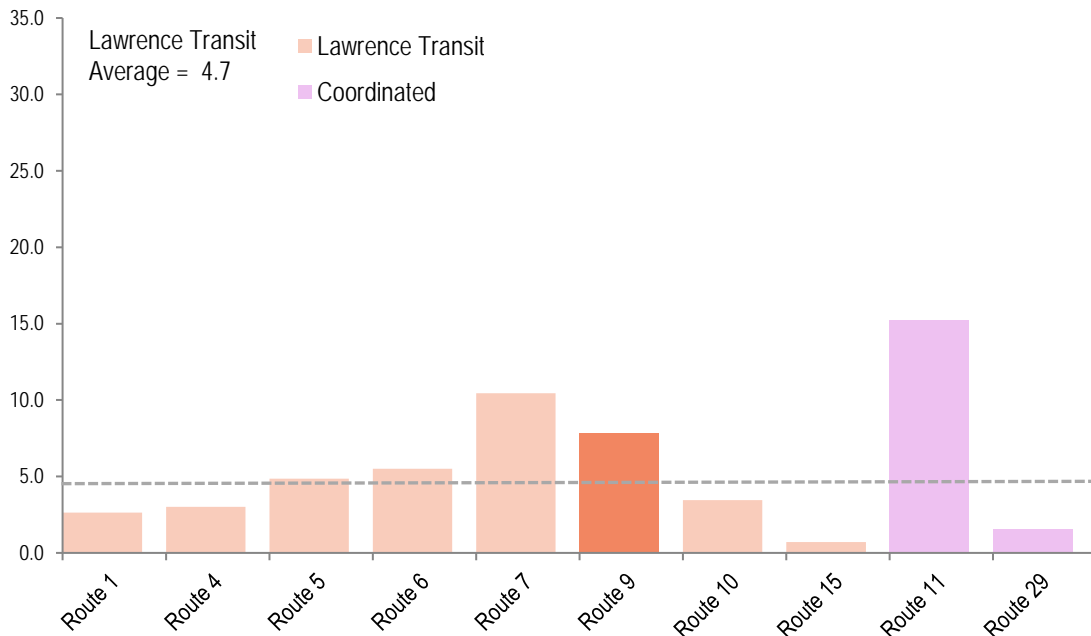
ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday inbound ridership stops on Route 9 are located at the route’s origin near Pine Ridge Plaza, and close to retail destinations at 6th Street and Wakarusa Drive (Figure 9). However, even at the most active stops, ridership does not exceed 10 combined boardings and alightings. Other stops with five or more boardings and alightings per weekday include: Wakarusa Drive at Bob Billings Parkway, Overland Drive at Free State High School, Wakarusa Drive at Marisco’s, and Wakarusa Drive at Inverness Drive. These stops primarily serve retail, residential, and educational destinations. All other stops serve fewer than five combined boardings and alightings (Figure 10-Figure 13).

Ridership in the outbound direction on weekdays at the stop at 31st Street and Iowa Street generates 16 combined boardings and alightings.

Saturday ridership patterns are similar to weekday patterns, but with slightly higher volumes (Figure 14-Figure 17). Ridership is highest at stops located near retail destinations, including Pine Ridge Plaza, Westgate Center Shops, and Wakarusa Crossroads; Rock Chalk Park also records a relatively high number of alightings on inbound trips.

Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

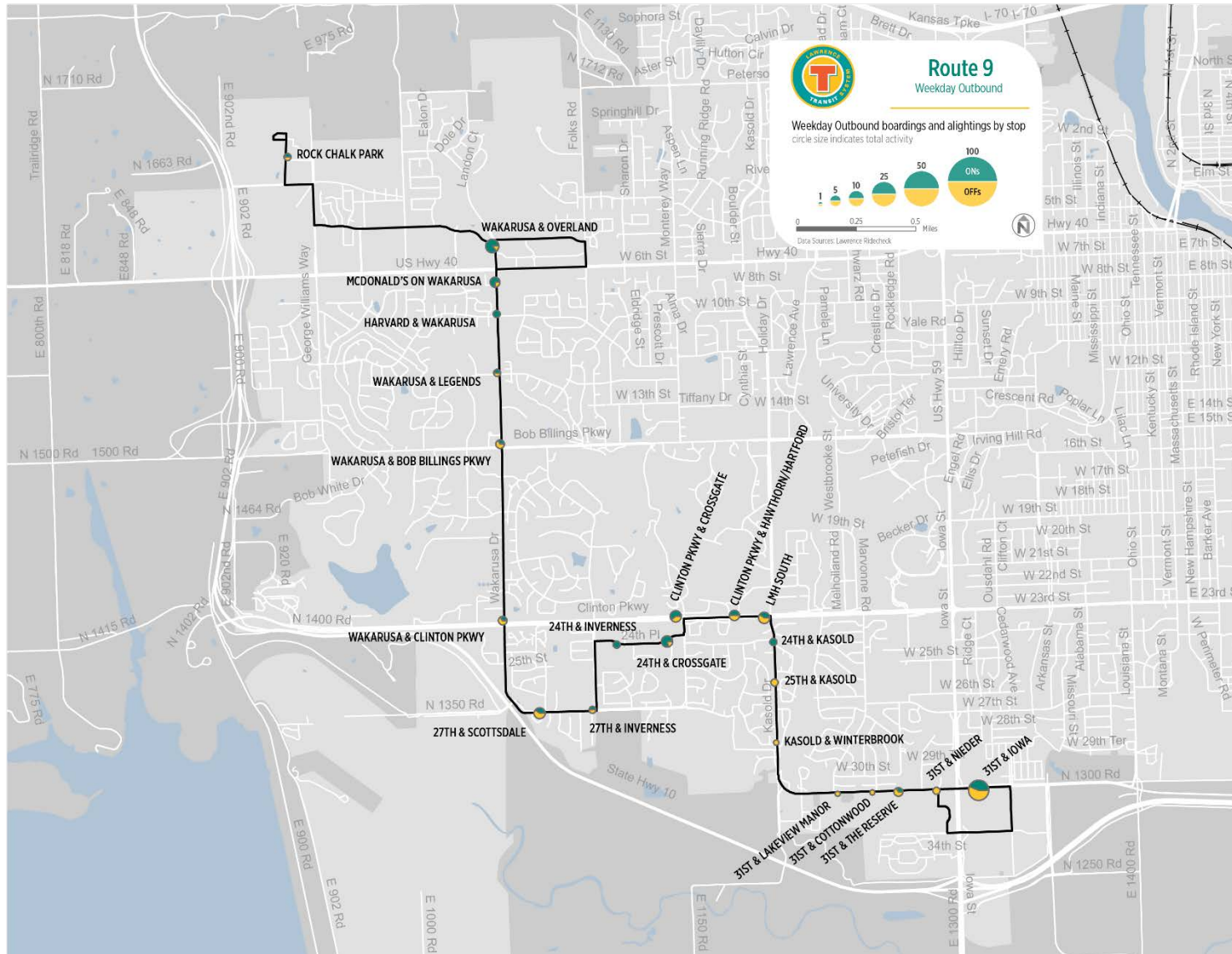
BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
31st Street / Iowa Street	10	Pine Ridge Plaza; local and national retailers
Wakarusa Drive / Bob Billings Parkway	8	Local and national retailers
Overland Drive / Free State High School	7	Free State High School; local and national retailers; residential neighborhoods
Wakarusa Drive / Marisco’s	5	Local and national retailers
Wakarusa Drive / Inverness Drive	5	Residential neighborhoods

*Weekday inbound ridership (boardings and alightings) for Route 9 only

ROUTE EVALUATION | ROUTE 9

Lawrence Transit

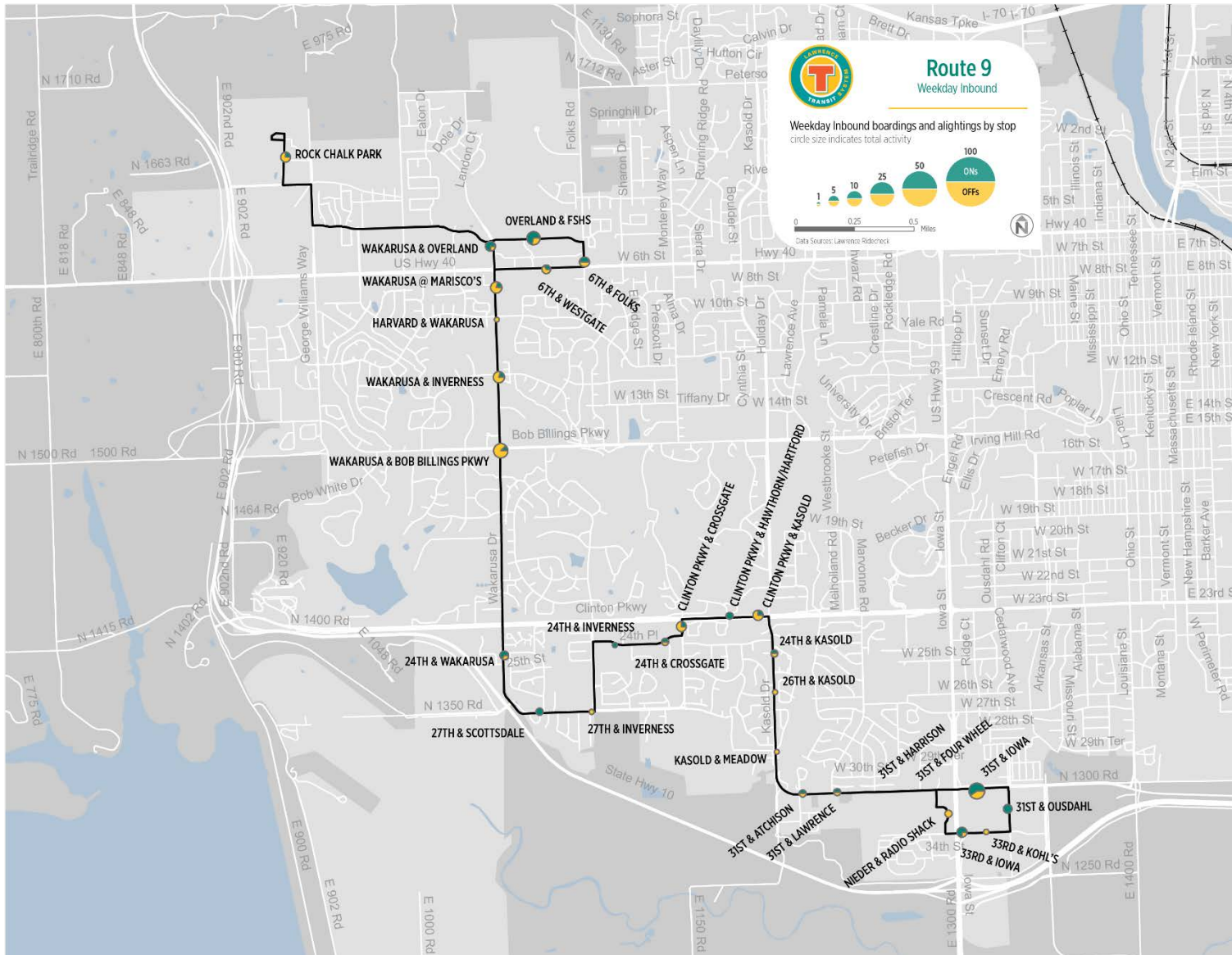
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

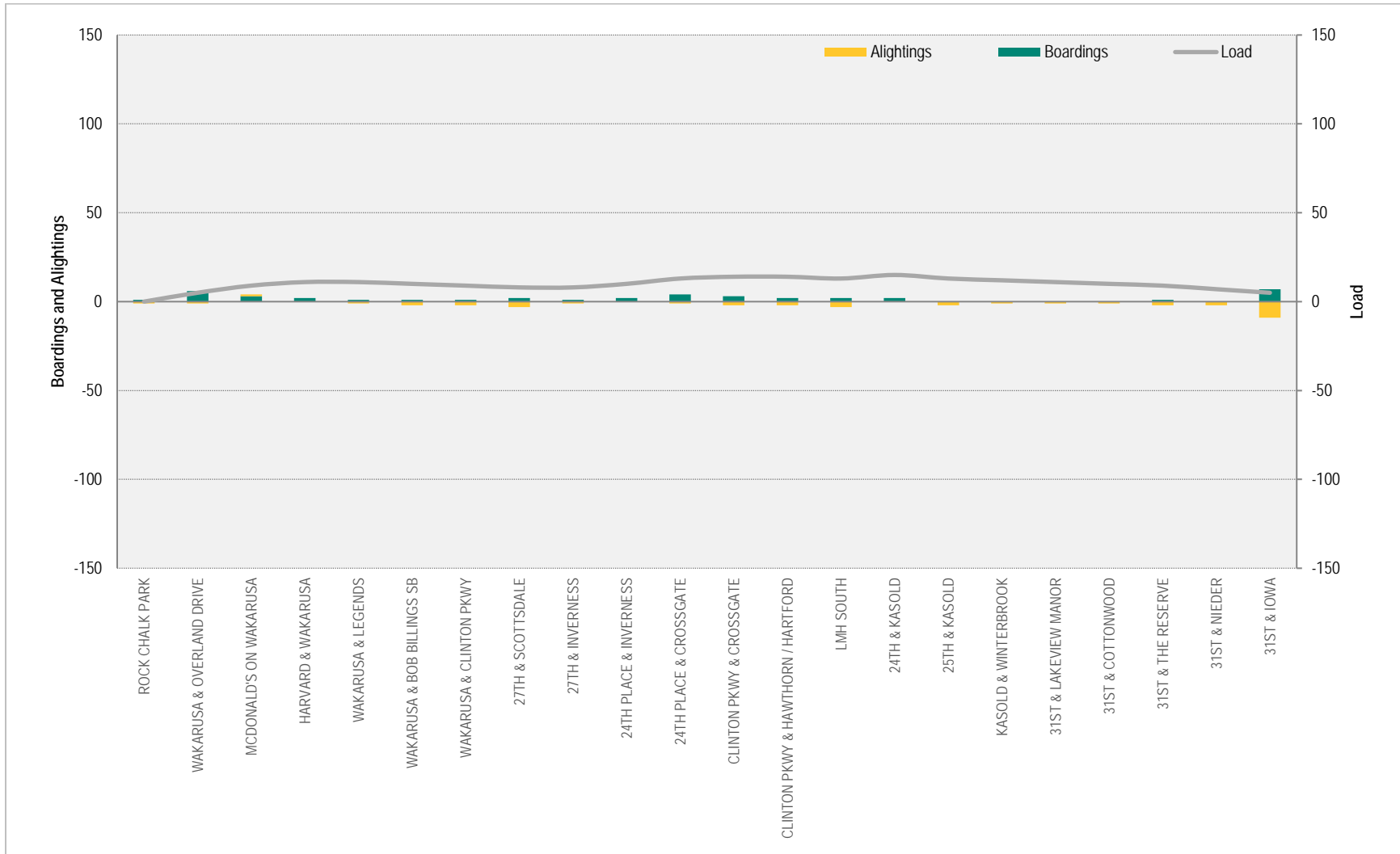
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

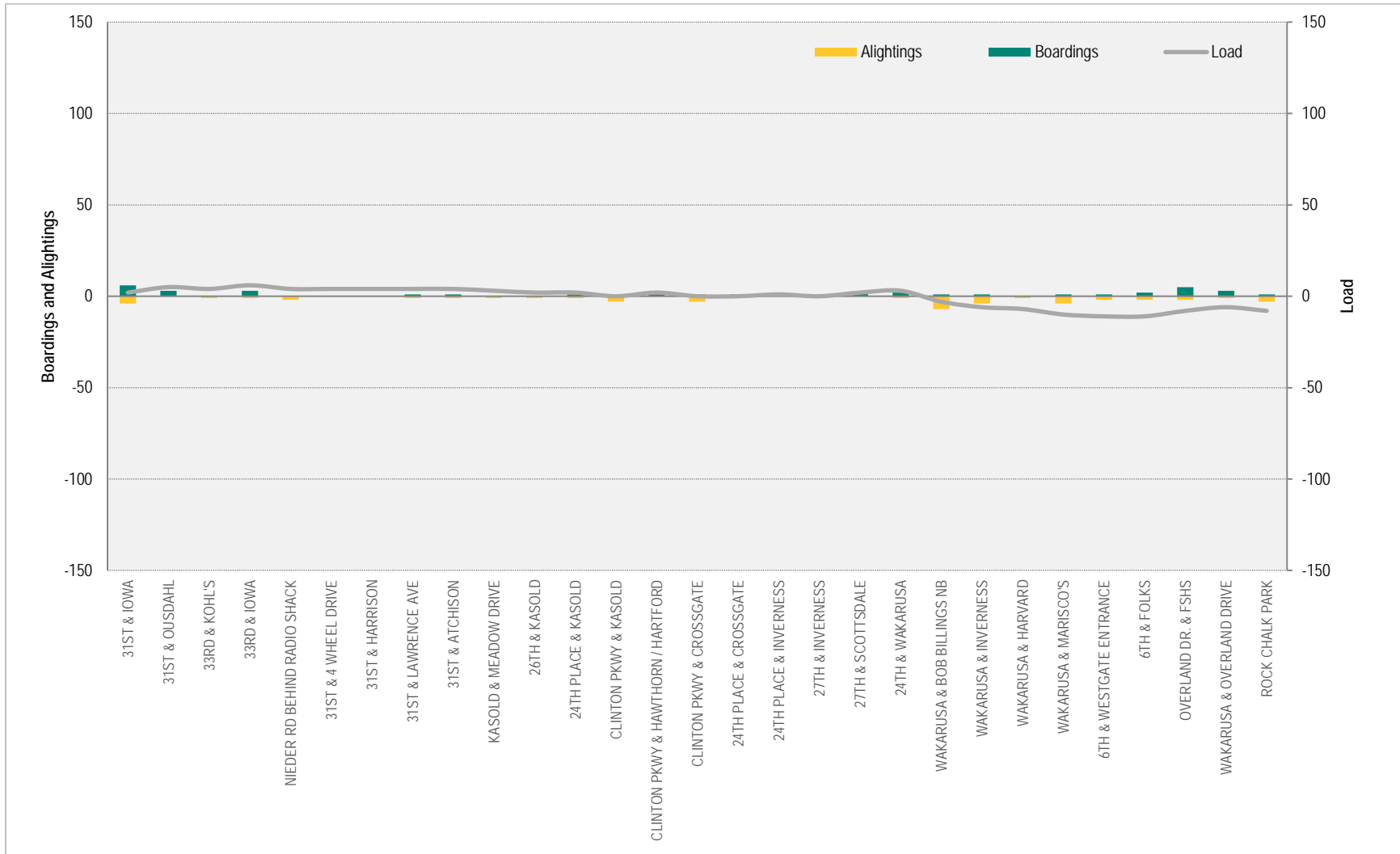
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

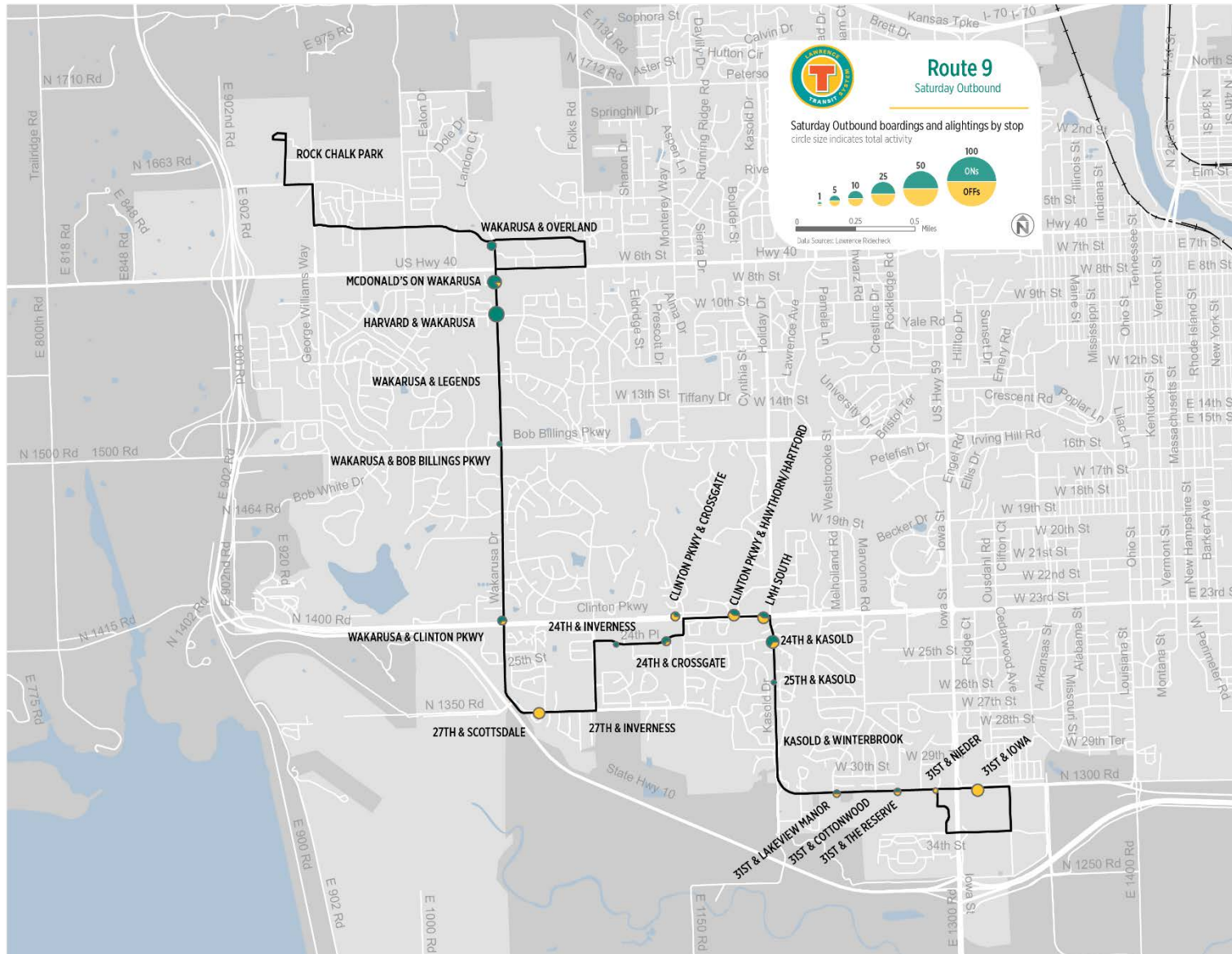
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 14 | Saturday Outbound Daily Ridership by Stop Map

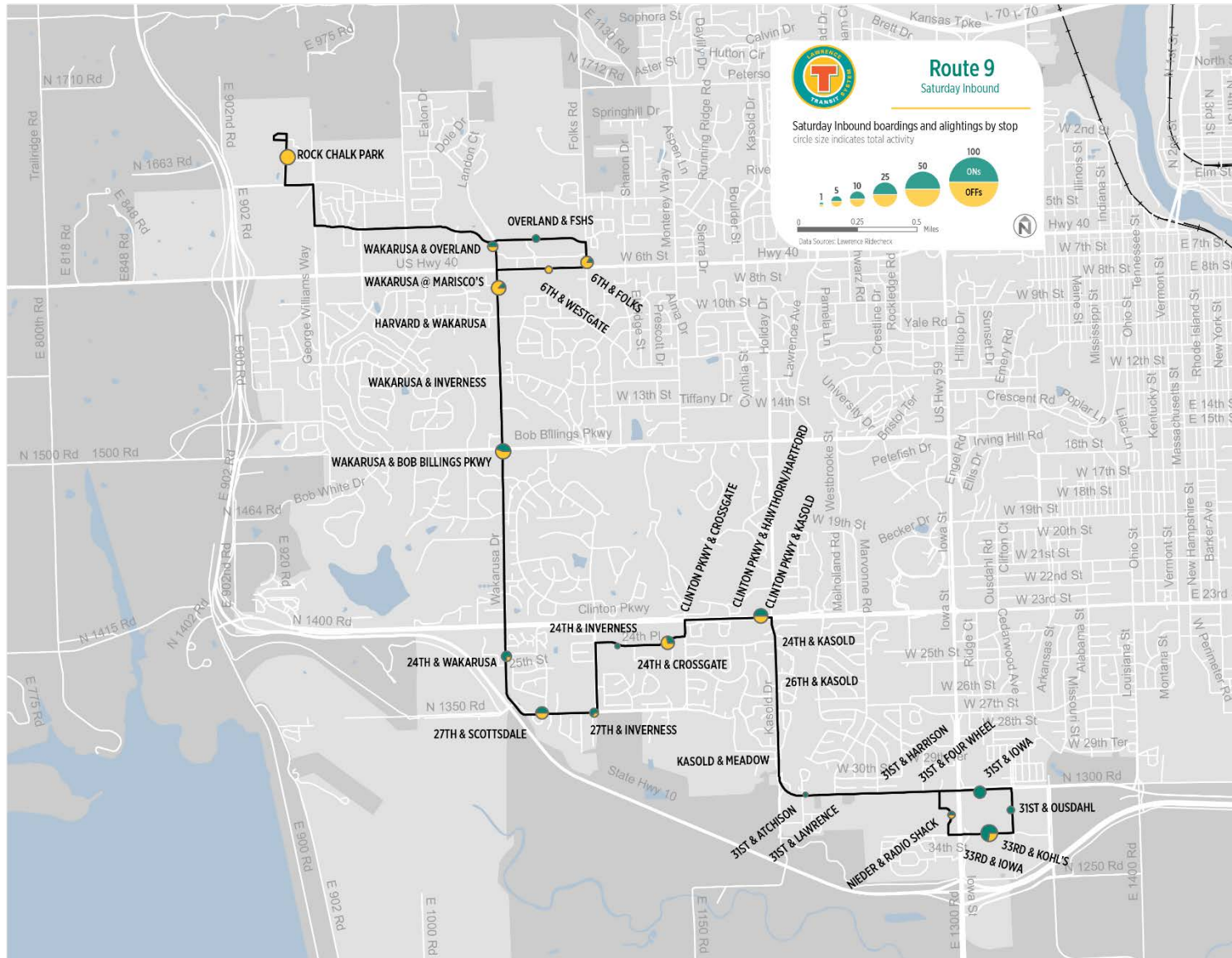


Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9

Lawrence Transit

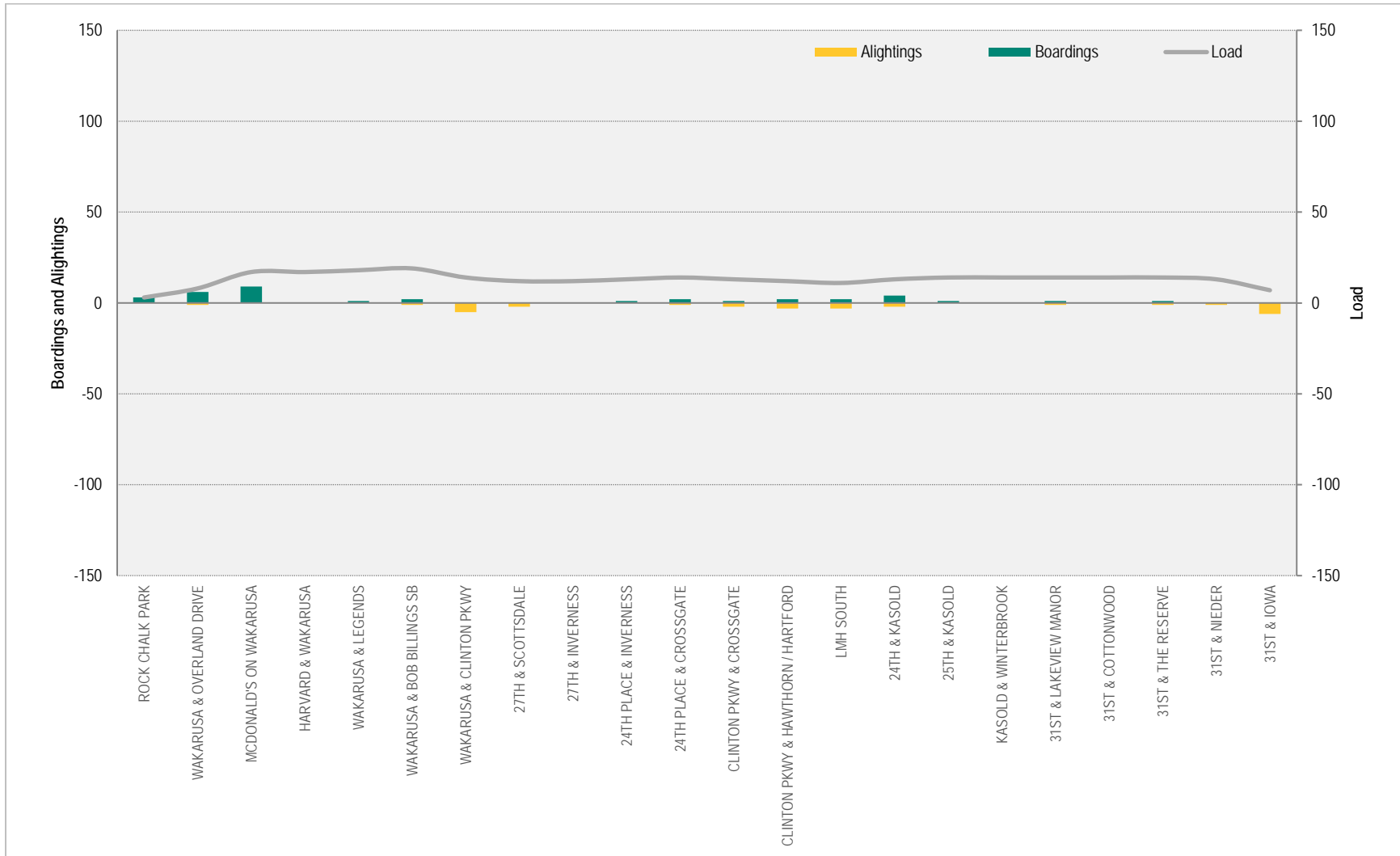
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

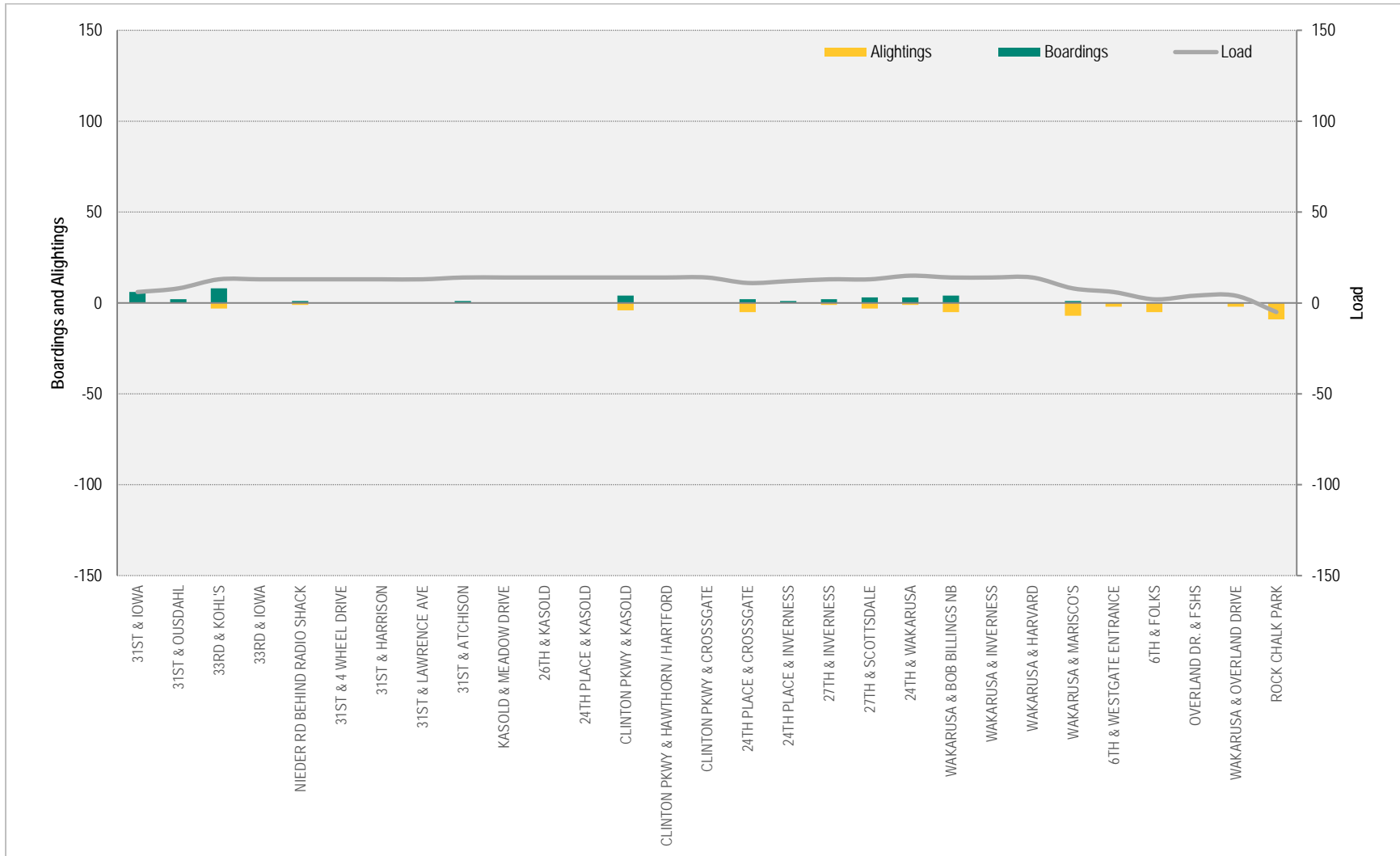
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

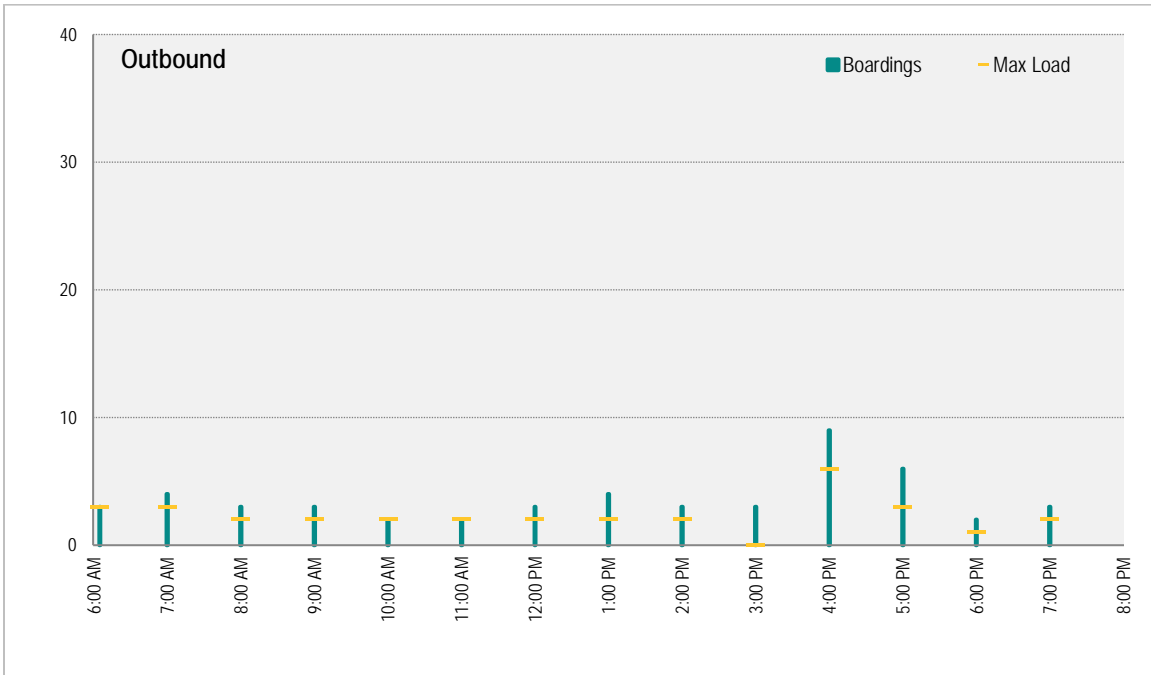
RIDERSHIP BY TRIP

On weekdays, Route 9 ridership is highest during the late afternoon service period, in both the outbound and inbound directions (Figure 18 and Figure 19). During these periods, ridership peaks at nine passengers outbound and eight passengers inbound. No trips in either direction carry more than 10 passengers.

On Saturdays, Route 9 ridership peaks at 2:00 PM in the outbound direction (seven passengers) and at 4:34 PM traveling in the inbound direction (seven passengers) (Figure 20 and Figure 21). No trips in either direction carry more than 10 passengers.

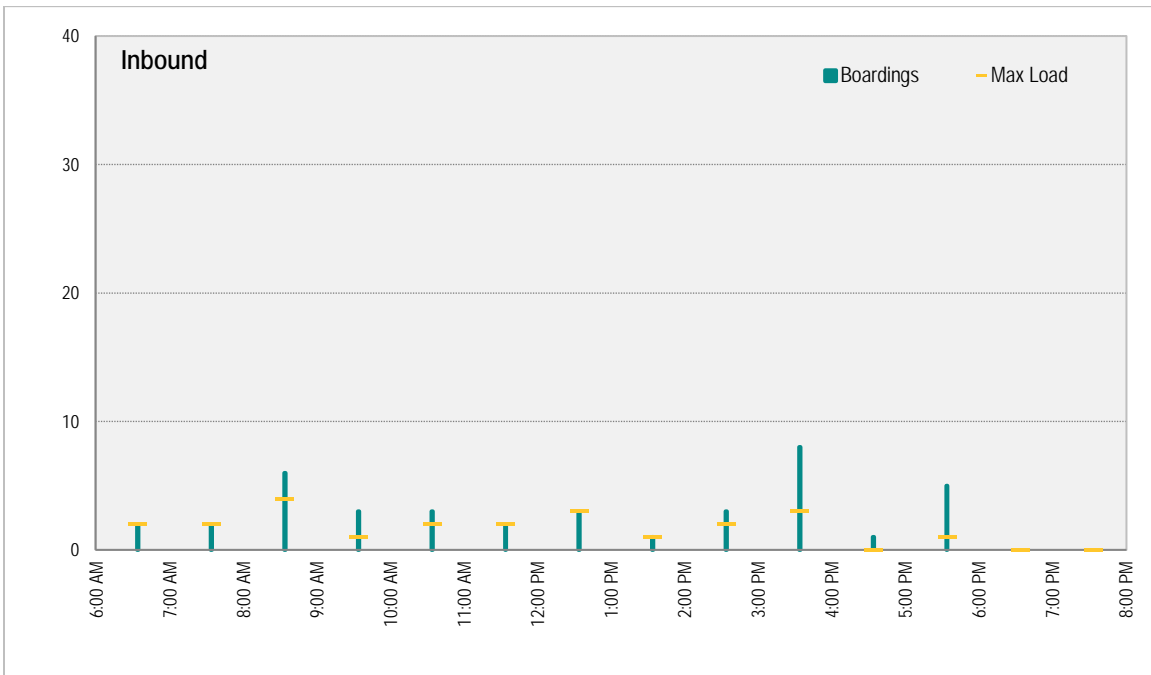
ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

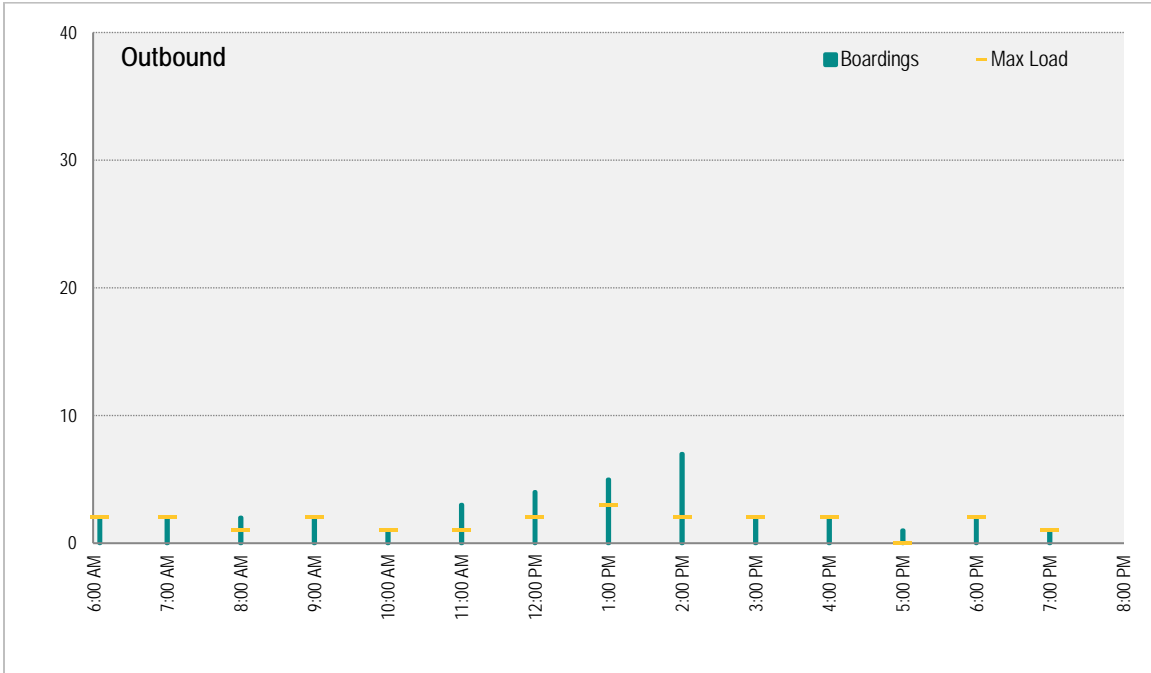
Figure 19 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

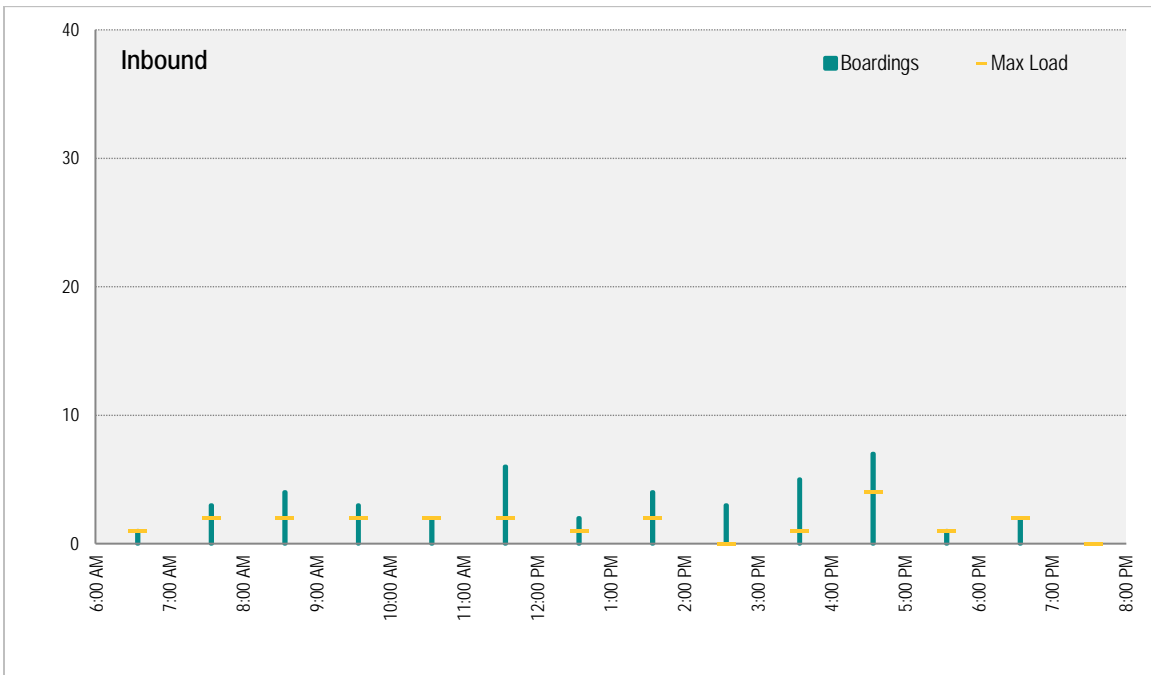
ROUTE EVALUATION | ROUTE 9
Lawrence Transit

Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

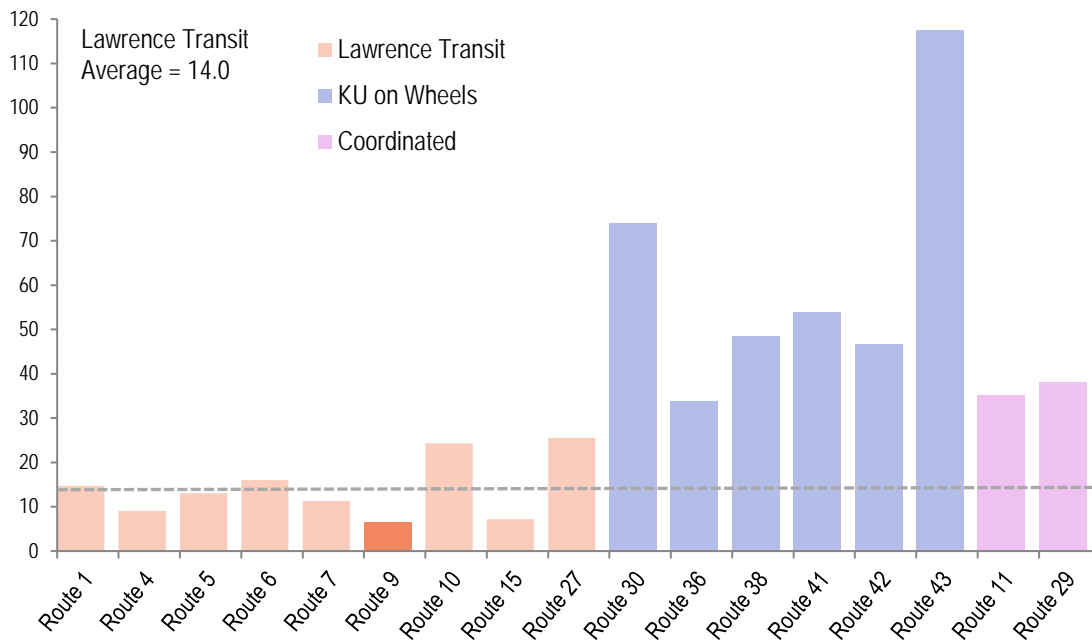
In terms of average passengers per hour, Route 9 is the least productive Lawrence Transit bus route on weekdays (Figure 22). The route carries 6.5 passengers per hour on weekdays, less than half of the system average (Figure 23). Route 9 is the second most productive Lawrence Transit bus route on Saturdays, carrying over twice as many passengers than on weekdays despite operating for the same number of service hours (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	91	14.0	6.5	14.0	9 of 9
Saturday	218	14.0	15.6	9.7	2 of 8

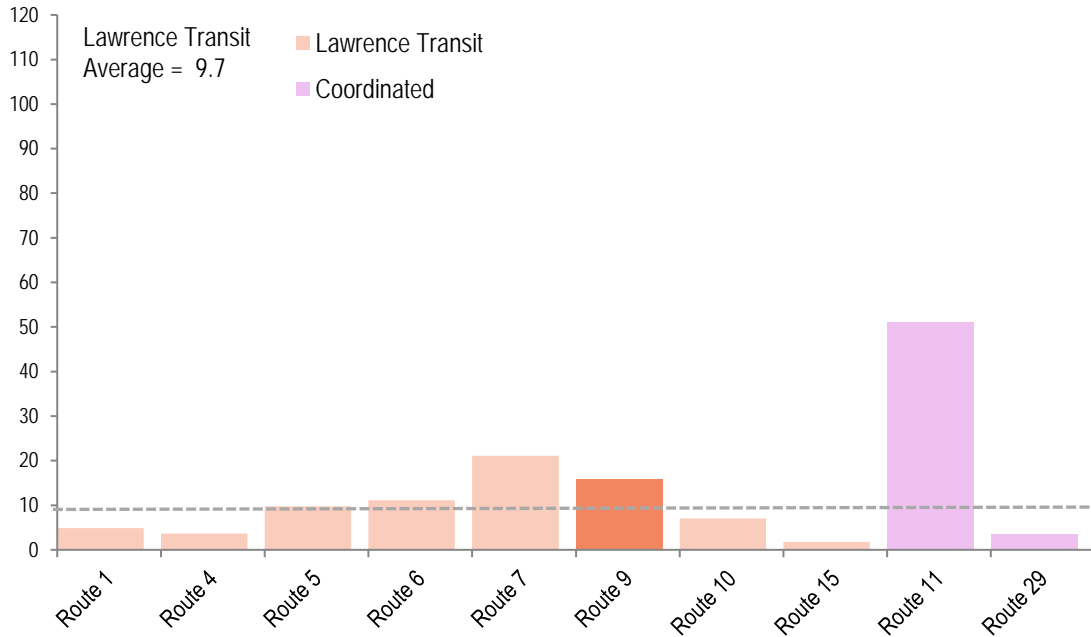
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 41.7% of Route 9 time points were served “on-time” during the survey period (Figure 25). On Saturdays, approximately 15.7% of Route 9 time points were served “on-time” during the survey period.” Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Both weekday and Saturday on-time performance were affected by late departures: on weekdays, 55% of time points are served late, while over 80% of Saturday time points are served late.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	41.7%	15.7%
Early	2.8%	2.9%
Late	55.6%	81.4%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 9 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Remove Service to Rock Chalk Park.** Service to Rock Chalk Park is unproductive, especially on weekdays. Connections exist between the park and shopping and low-density residential areas, but these are less useful with no direct connections between the park and KU or downtown Lawrence. Transfer opportunities are also not well-timed and infrequent. Operating service to Rock Chalk Park that has direct connections to downtown and/or KU would likely be more productive.

As of August 1, 2016, Route 6 now operates service to Rock Chalk Park instead of Route 9, creating a direct connection between downtown Lawrence and Rock Chalk Park.

- **Operate Along Clinton Parkway and Iowa Street.** Currently, Route 9 operates along Kasold Drive and 31st Street between Clinton Parkway and Pine Ridge Plaza. This segment of the route is particularly unproductive. Operating a more direct route along Clinton Parkway and Iowa Street would potentially attract more riders by making connections to land uses other than residential areas and improve operations.
- **End Service on Route 9 North of Clinton Parkway.** Though ridership patterns do not show links between origins and destinations, the overall low productivity on Route 9 indicates that few riders need to make the connections provided by the route. In addition, the number of through travelers going from one terminus to the other is likely low, and the segment along Wakarusa Drive between Clinton Parkway and Bob Billings Parkway has no ridership. It may be beneficial to serve parts of Wakarusa Drive with other Lawrence Transit routes, and focus Route 9 on serving Clinton Parkway and the retail areas on Iowa Street.

Lawrence Transit System

ROUTE 10

Downtown to 6th & Wakarusa

SERVICE DESIGN

Route 10 is a Lawrence Transit route that operates between Downtown Lawrence and the intersection of 6th Street and Wakarusa Drive in northwest Lawrence. The route travels primarily along Vermont Street, Jayhawk Drive, Bob Billings Parkway, and Wakarusa Drive (Figure 1). Route 10 provides service to government buildings and retail destinations in Downtown Lawrence, as well as the KU Main Campus, Lawrence Social Security Office, Dillons, Bauer Farm Shopping Center, Free State High School, and the 6th Street Walmart Supercenter.

ALIGNMENT/SERVICE PATTERNS

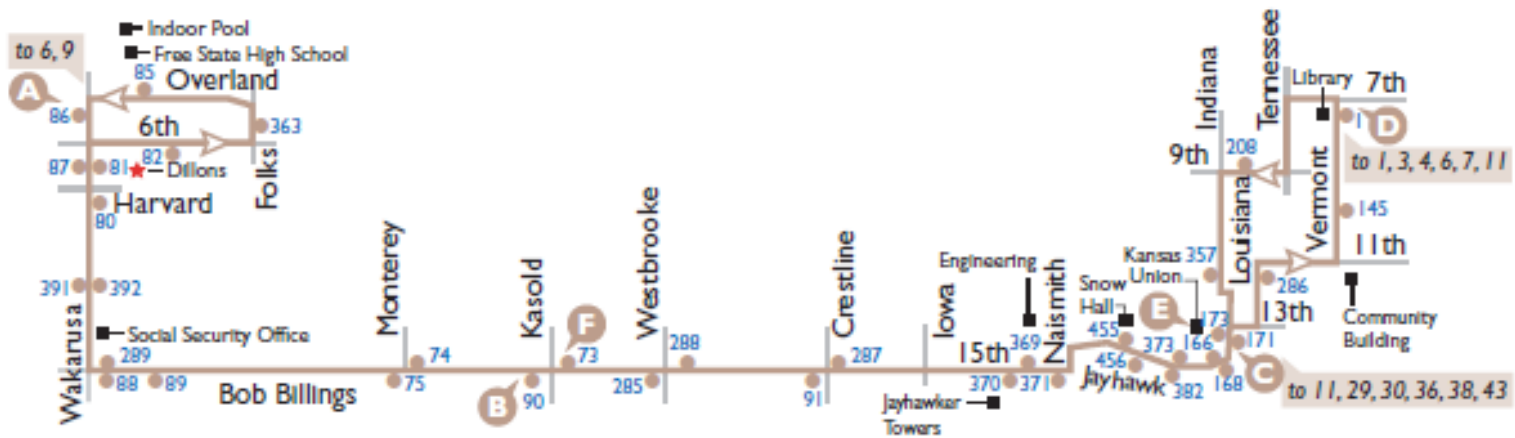
Route 10 has a single consistent service pattern for Weekday and Saturday service. Departing outbound from the intersection of 7th Street and Vermont Street in Downtown Lawrence, Route 10 turns left on 7th Street, left on Tennessee Street, right on 9th Street, left on Indiana Street, left on 12th Street, and right on Oread Avenue before serving the Kansas Union and passing through the KU Main Campus on Jayhawk Drive. The route then continues by turning left on Naismith Drive, right on 15th street, straight across Iowa Drive onto Bob Billings Parkway, right on Wakarusa Drive, right on 6th Street, left on Folks Road, left on Overland Drive, left on Wakarusa, and terminating near the intersection with 6th Street.

Returning inbound from 6th Street and Wakarusa Drive, Route 10 continues along the outbound alignment until reaching the Kansas Union. After serving the Kansas Union, the route continues by turning right on 13th Street, left on Louisiana Street, right on 11th Street, left on Vermont Street, and then terminating just before the intersection with 7th Street.

Figure 1 | Route Map

10 Downtown to 6th & Wakarusa

- A** Timing point
- Bus stop
- # Bus stop number
- ★ Bus pass sales location



Source: Lawrence Transit; August 2015 – August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 10 and several Lawrence Transit and KU on Wheels Routes at 6th Street and Wakarusa, the Kansas Union, and the Downtown Transit Hub (7th & Vermont). There are also transfer opportunities at several other points along the route, including on Wakarusa Drive (Route 9), sections of Bob Billings Parkway (Route 30), 15th Street (Route 29, 30, and 43), Jayhawk Boulevard (Route 11, 29, 30, 36, 38 and 43), and on Vermont Street (Route 1, 7, and 15 (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Wakarusa Drive and Overland Drive	Route 6 and Route 9
Kansas Union	Route 11, Route 29, Route 30, Route 36, Route 38, Route 43
Downtown Transit Hub	Route 1, Route 3, Route 4, Route 6, Route 7, and Route 11

SERVICE SCHEDULE

Route 10 operates Monday–Saturday year round (Figure 3). On weekdays and Saturdays, the route runs every 60 minutes from 6:03 AM to 8:00 PM. Route 10 does not run on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:03 AM – 8:00 PM	60	14/14
Saturday	6:03 AM – 8:00 PM	60	14/14
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 10 ranks second of nine Lawrence Transit routes in terms of weekday ridership and first of nine in terms of ridership per trip (Figure 4). On average, the route carries 338 passengers per day, or 12.1 passengers per trip, on weekdays (Figure 5 and Figure 6). On Saturdays, Route 10 carries 97 passengers per day, or 3.5 passengers per trip (Figure 7 and Figure 8). Route 10 ridership drops over 70% between weekday and Saturday service.

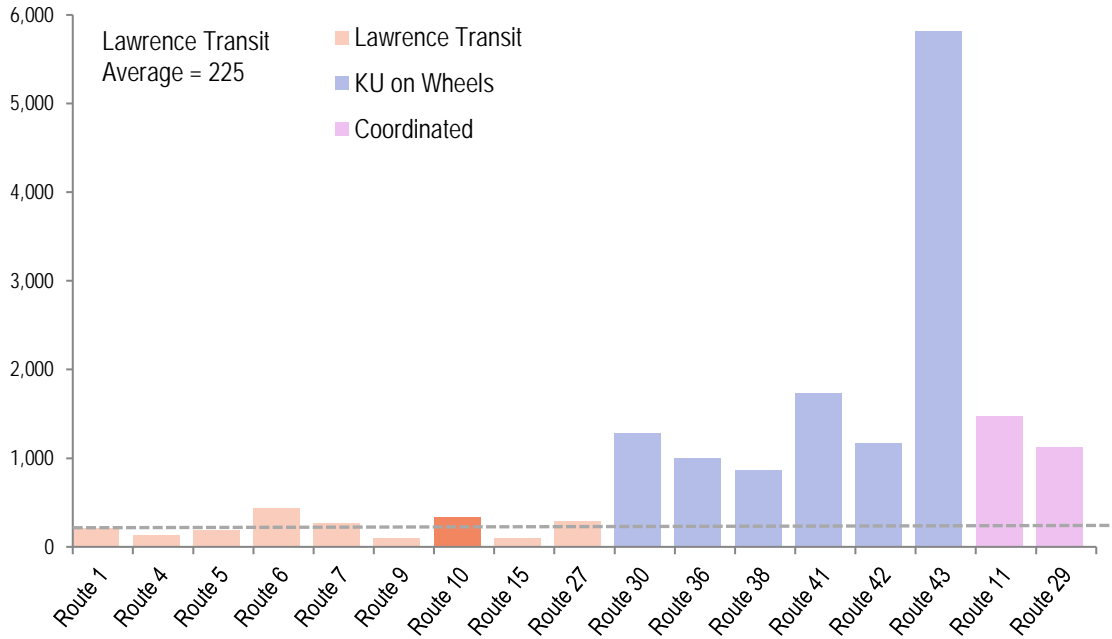
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	338	28	12.1	6.5	1 of 9
Saturday	97	28	3.5	4.7	5 of 8

Source: Lawrence Transit, 2016

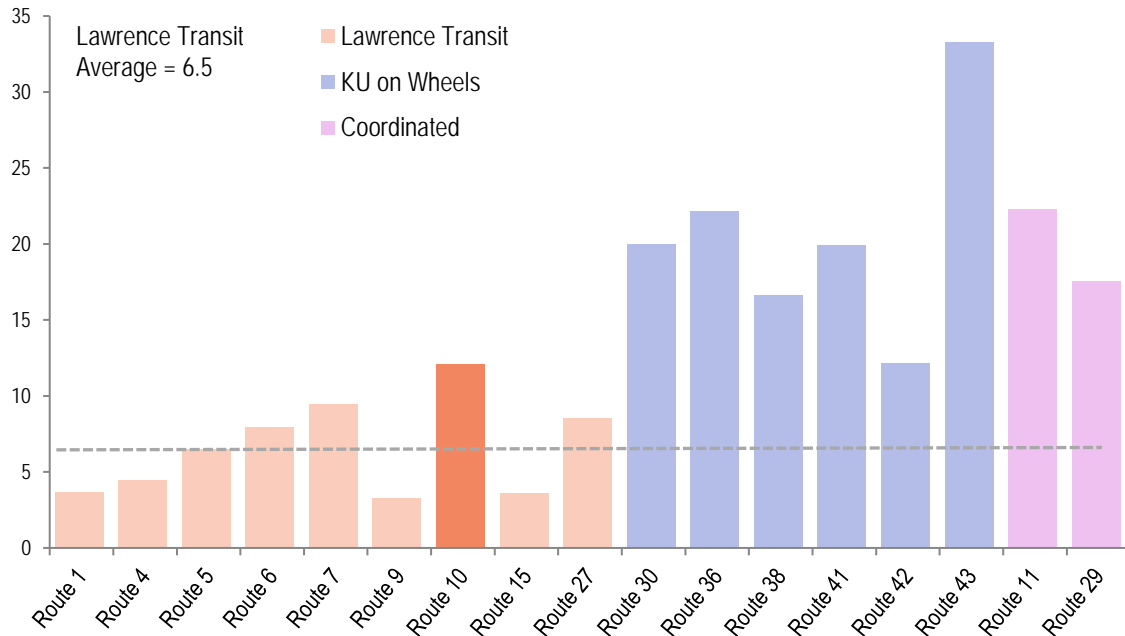
ROUTE EVALUATION | ROUTE 10
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

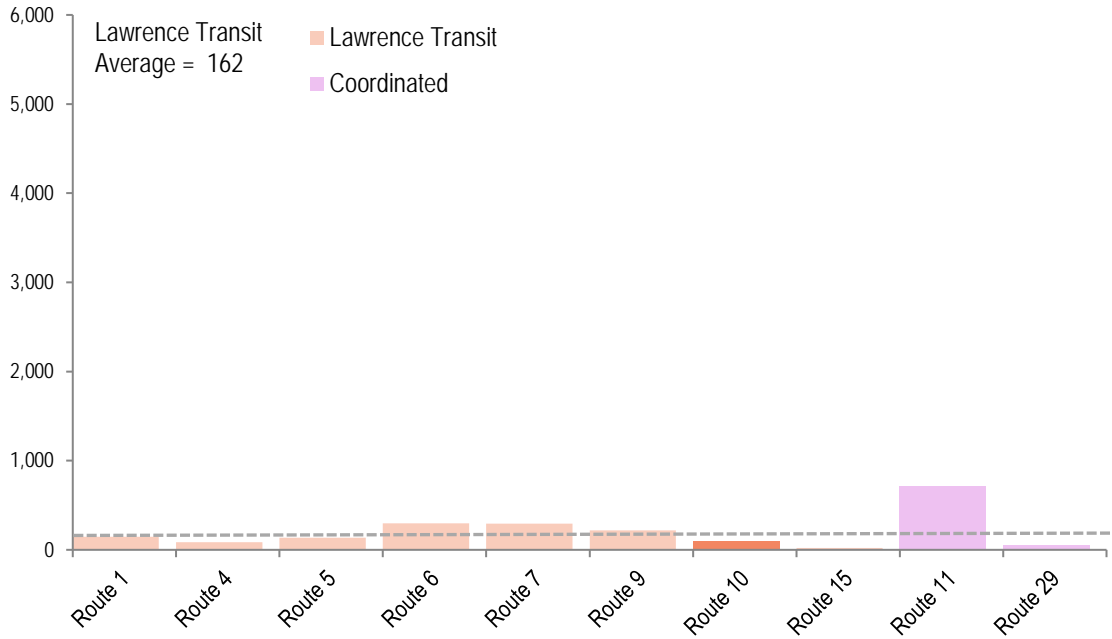
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

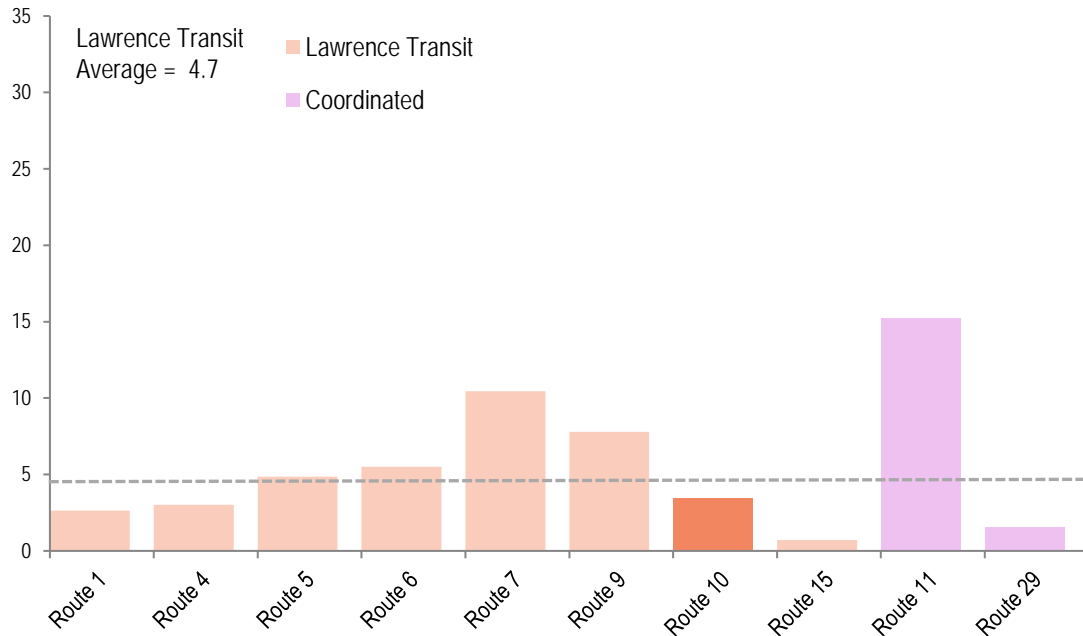
ROUTE EVALUATION | ROUTE 10
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 10 are located on KU’s campus at the Kansas Union, Snow Hall, the Engineering stop, and Jayhawker Towers (Figure 9). Other stops with more than 20 boardings and alightings per weekday include: the Downtown Transit Hub, the Orchards Corners shopping center (Bob Billings and Kasold), and the Bristol Terrace apartment complex (Bob Billings and Bristol Terrace). These stops serve multiple residential areas and several commercial destinations. All other stops serve fewer than 20 boardings and alightings (Figure 10-Figure 13).

Saturday ridership patterns are similar to weekday patterns, but with significantly lower volumes (Figure 14-Figure 17). Ridership on routes serving college campuses typically declines disproportionately on weekends when classes are not in session.

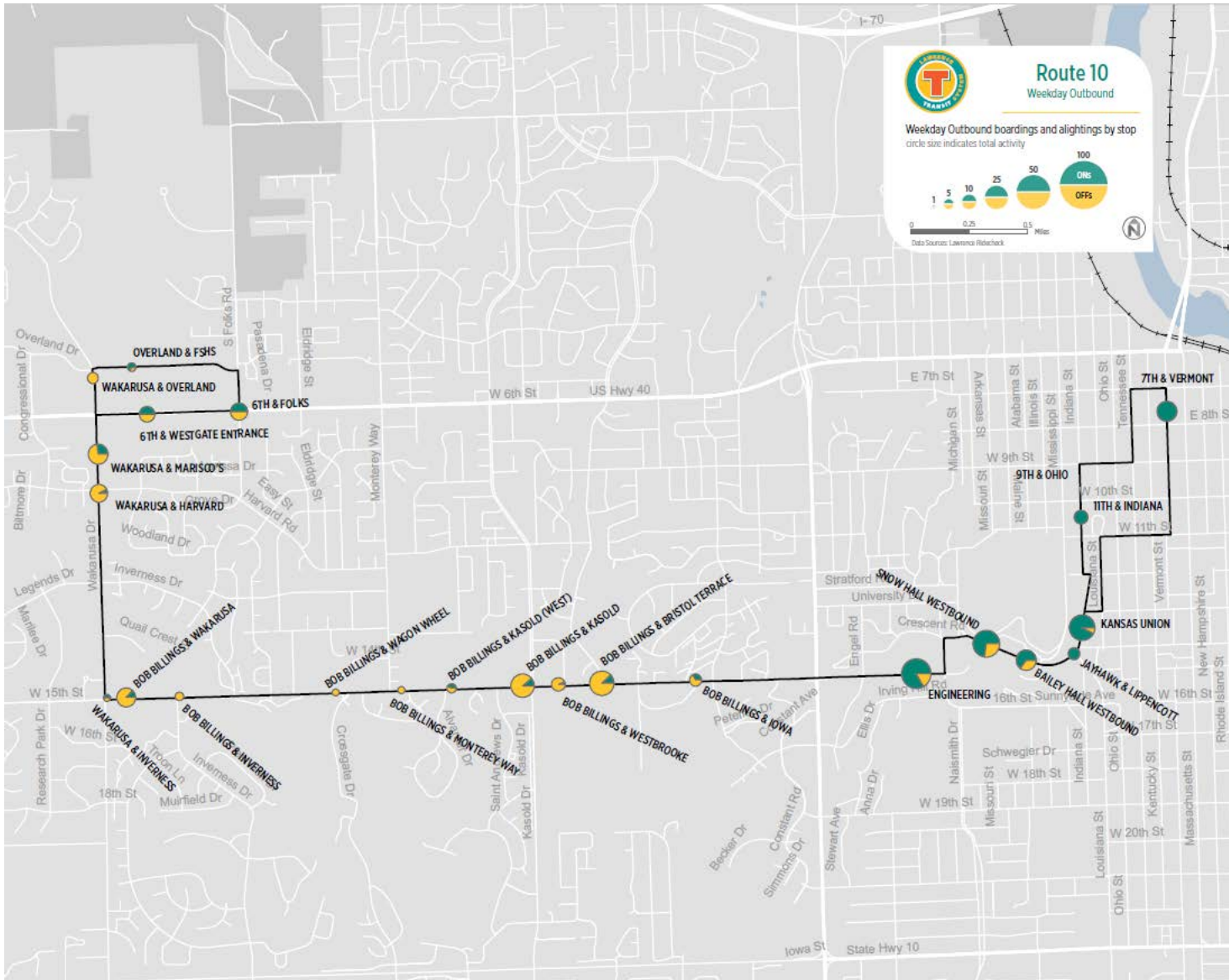
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Jayhawker Towers	54	Jayhawker Towers Apartments, School of Law
Engineering	36	School of Engineering, School of Law
Bob Billings and Bristol Terrace	35	Bristol Terrace Apartments
Snow Hall	30	Department of Engineering and Mathematics
Kansas Union	28	Kansas Union

*Weekday ridership (boardings and alightings) for Route 10 only

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

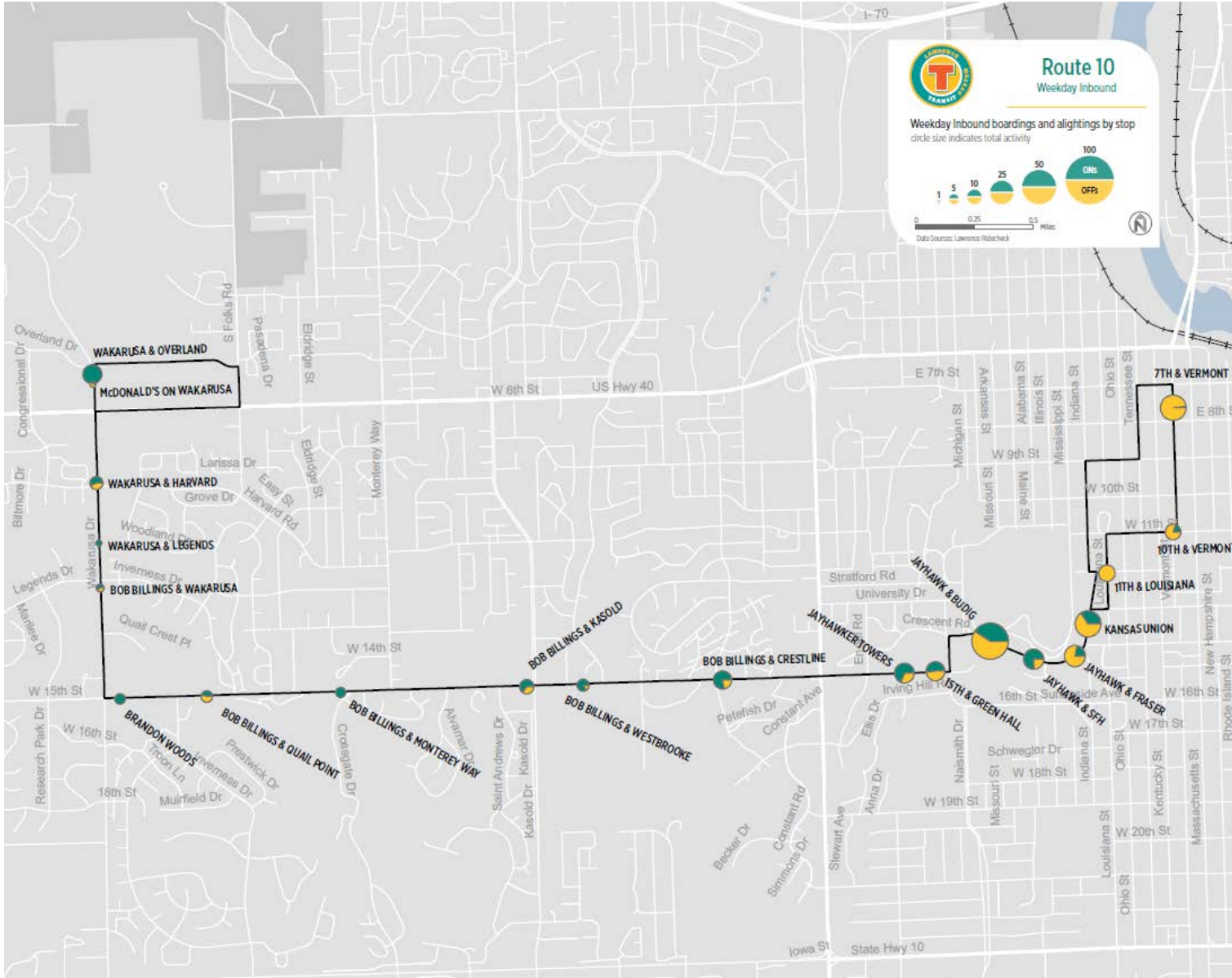
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

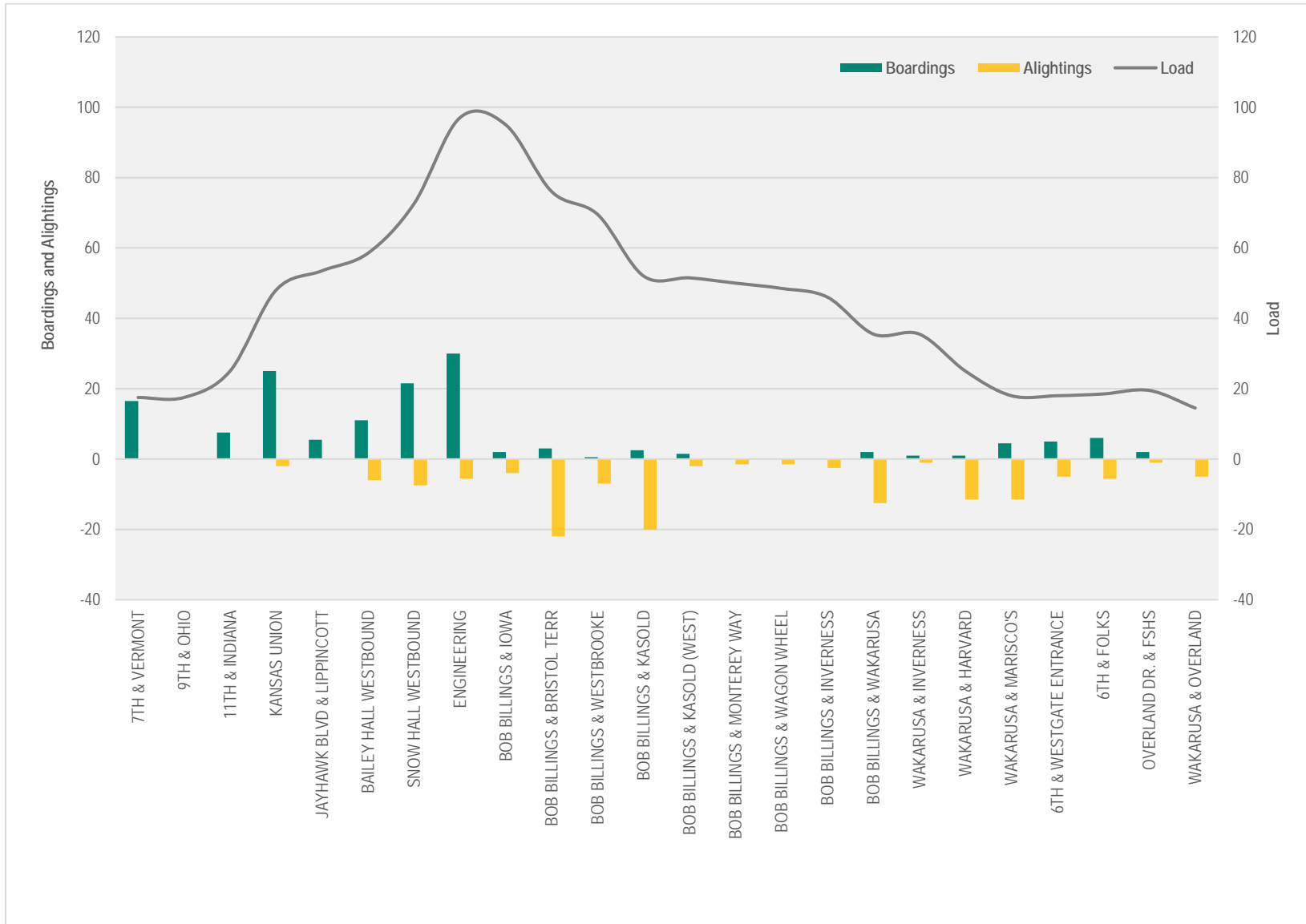
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

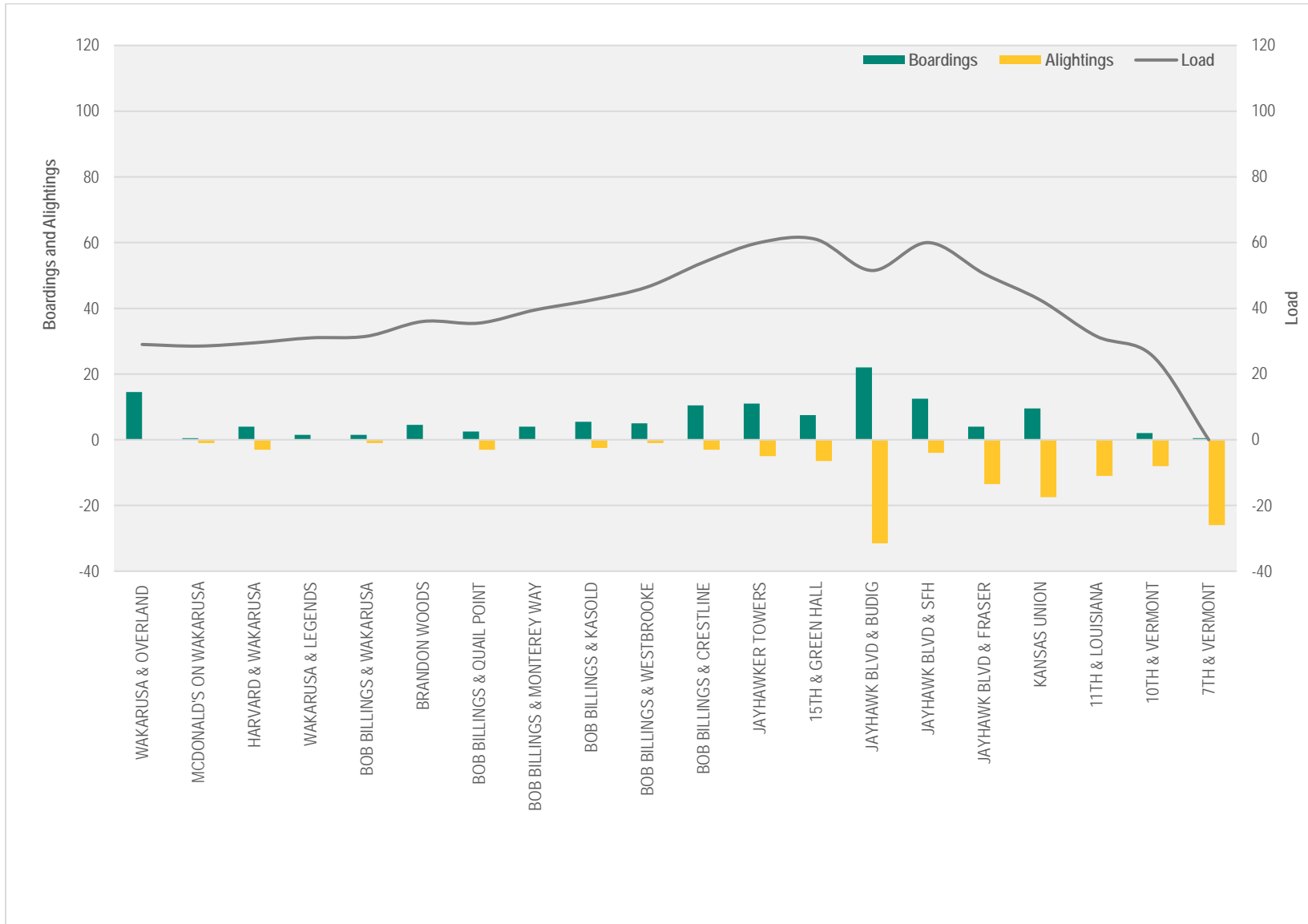
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

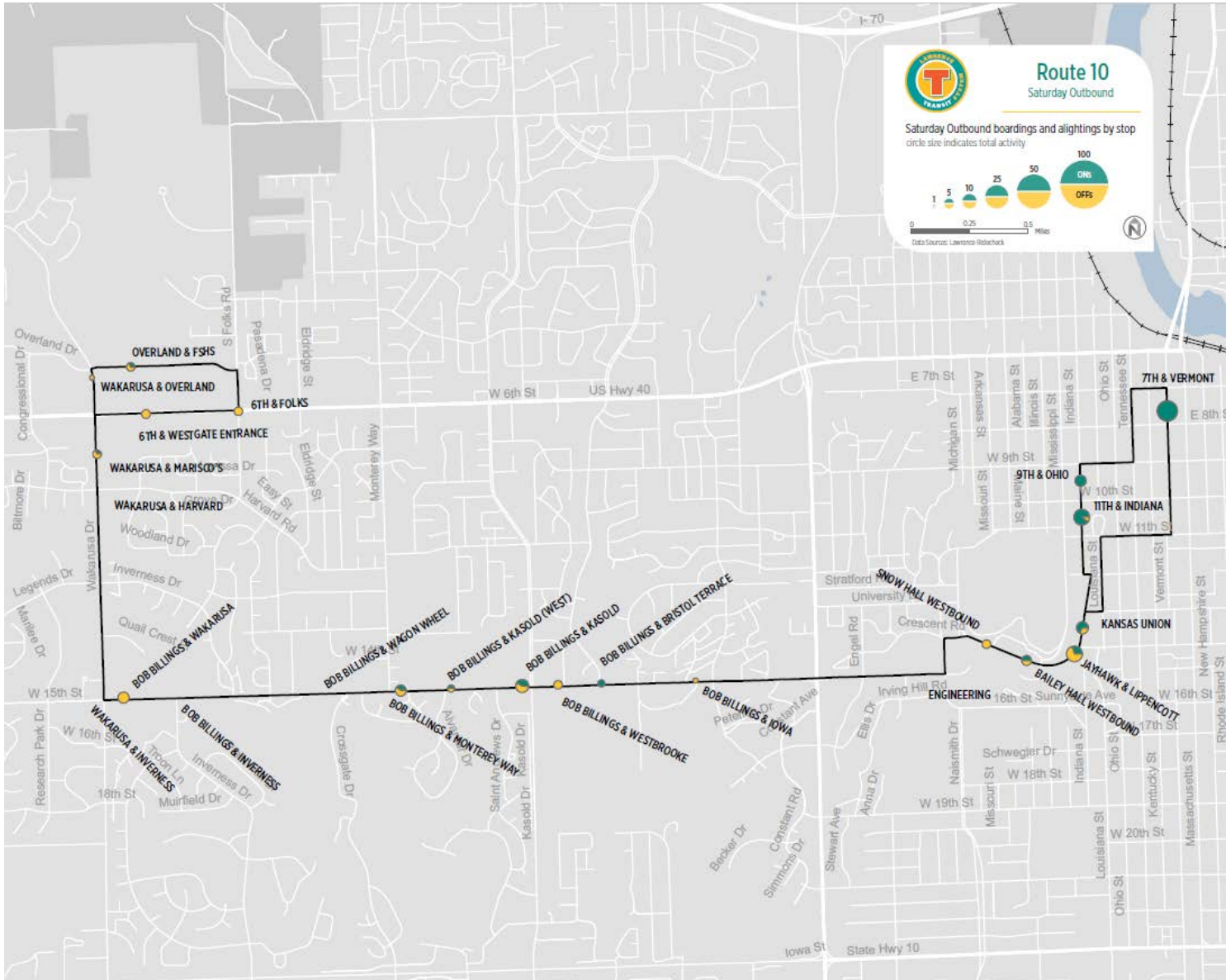
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

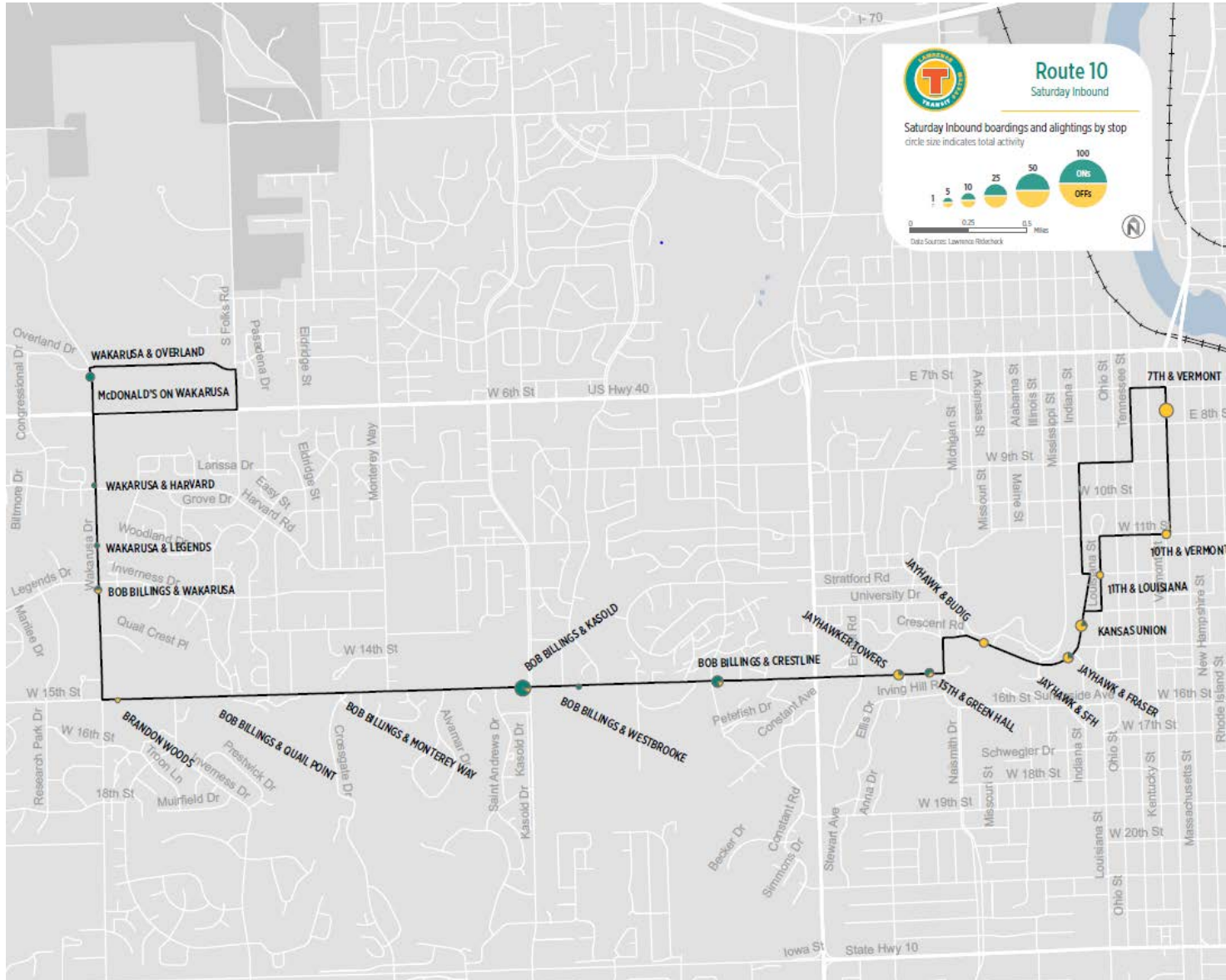
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

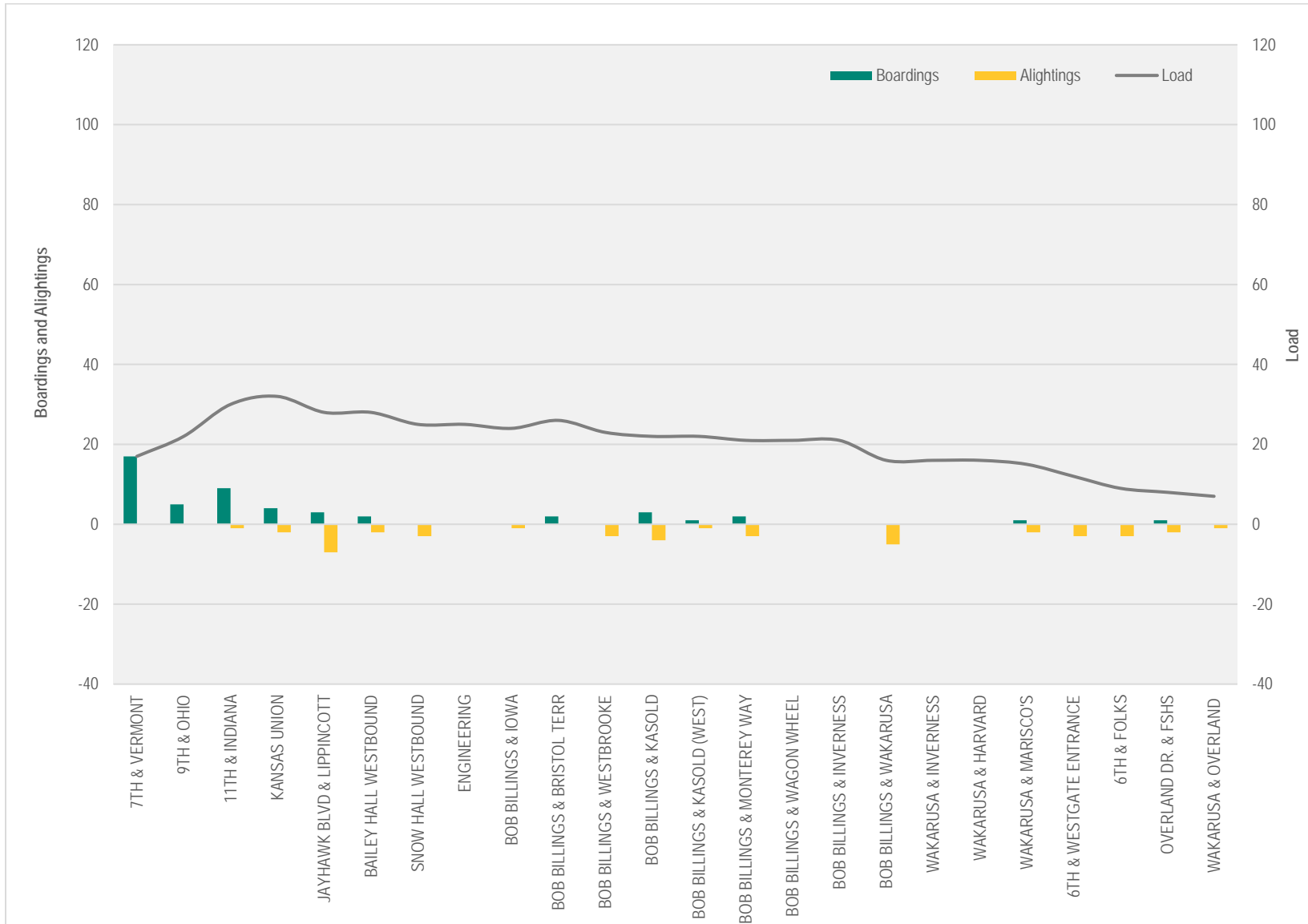
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

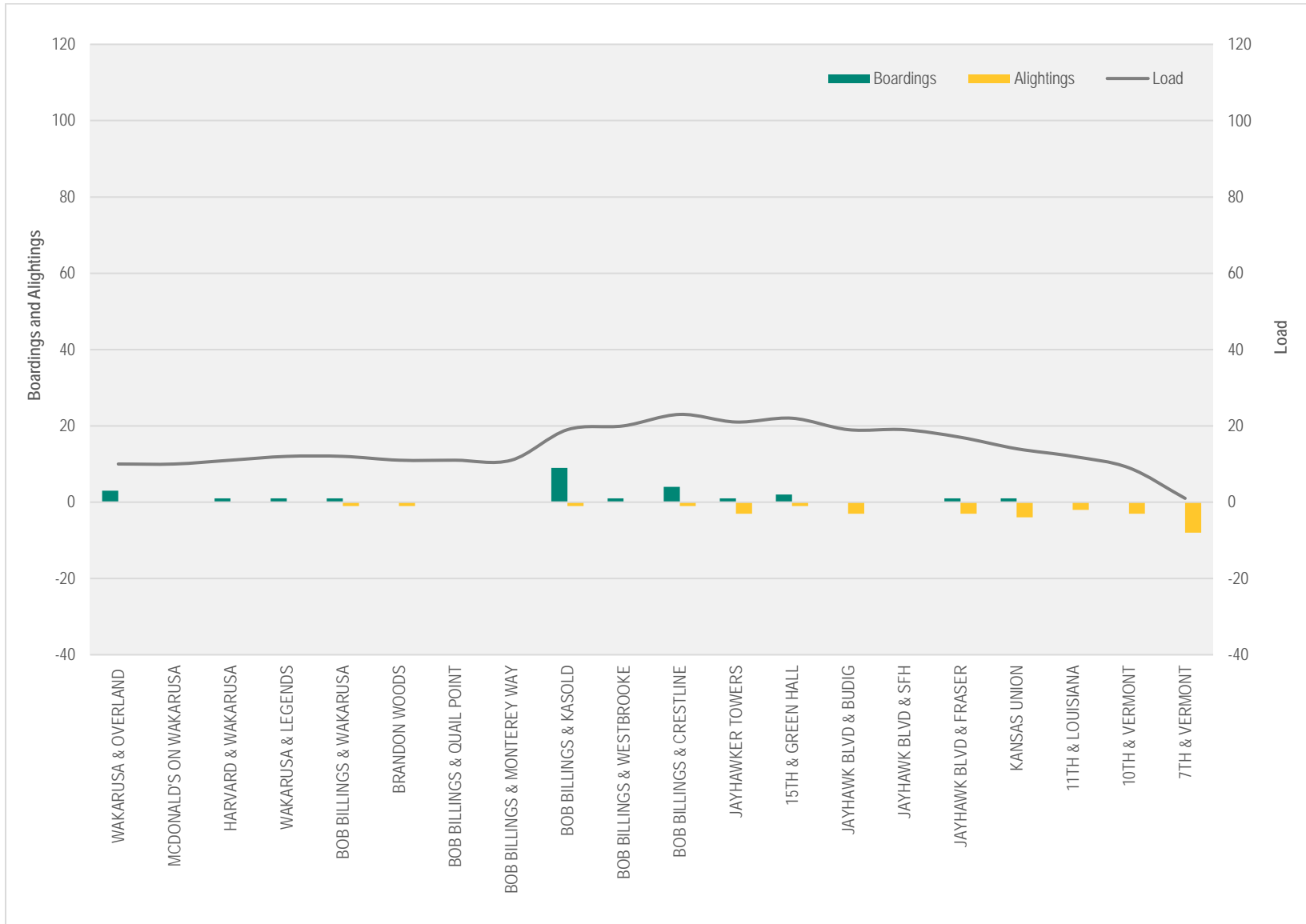
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 10
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



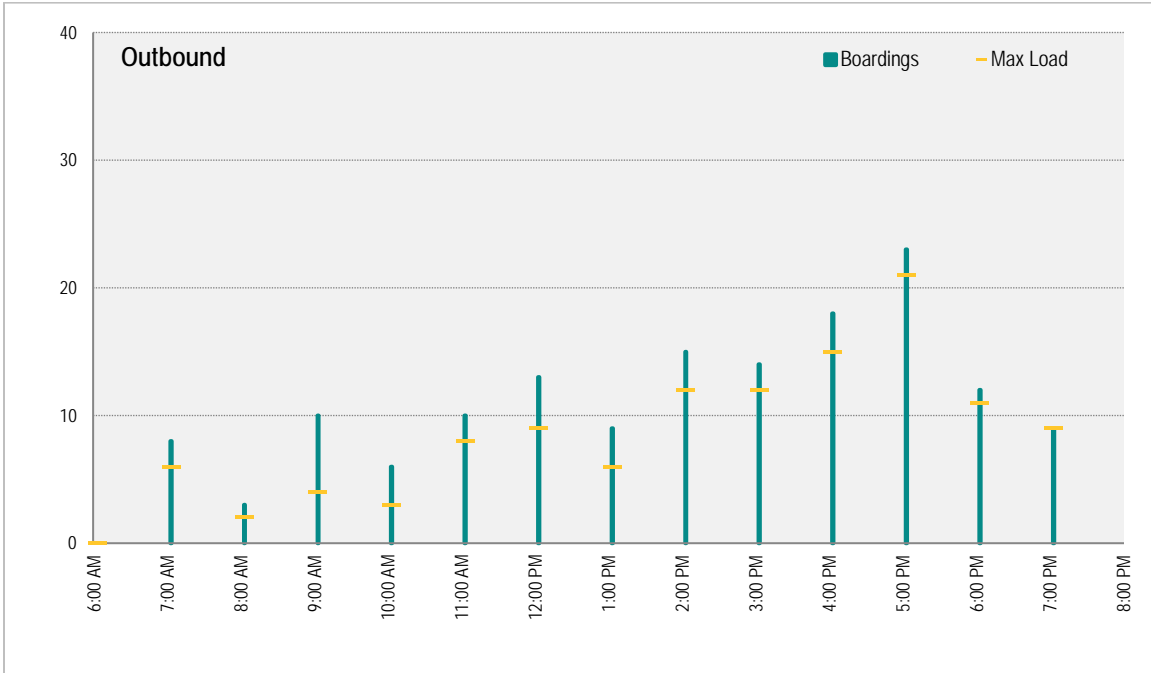
Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

On weekdays, Route 10 ridership is highest in the outbound direction in the early evening, when KU students, faculty, and staff are leaving campus; boardings peak at 5:03 PM, with an average of 23 passengers per trip. Inbound ridership is highest during the midday period (1:00 – 3:00 PM), when trips average 18-19 passengers (Figure 18 and Figure 19).

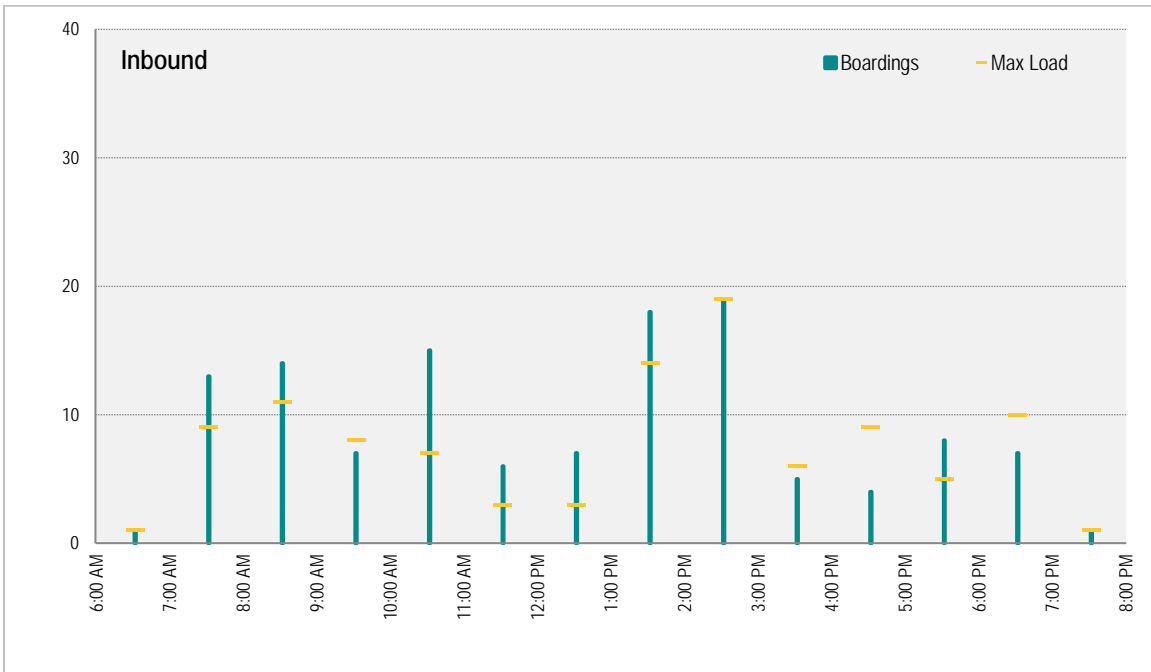
On Saturdays, Route 10 ridership is highest in the outbound direction from 2:00 – 6:00 PM. This period averages seven boardings per trip, and peaks at nine passengers per trip at 6:03 PM (Figure 20 and Figure 21).

Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.

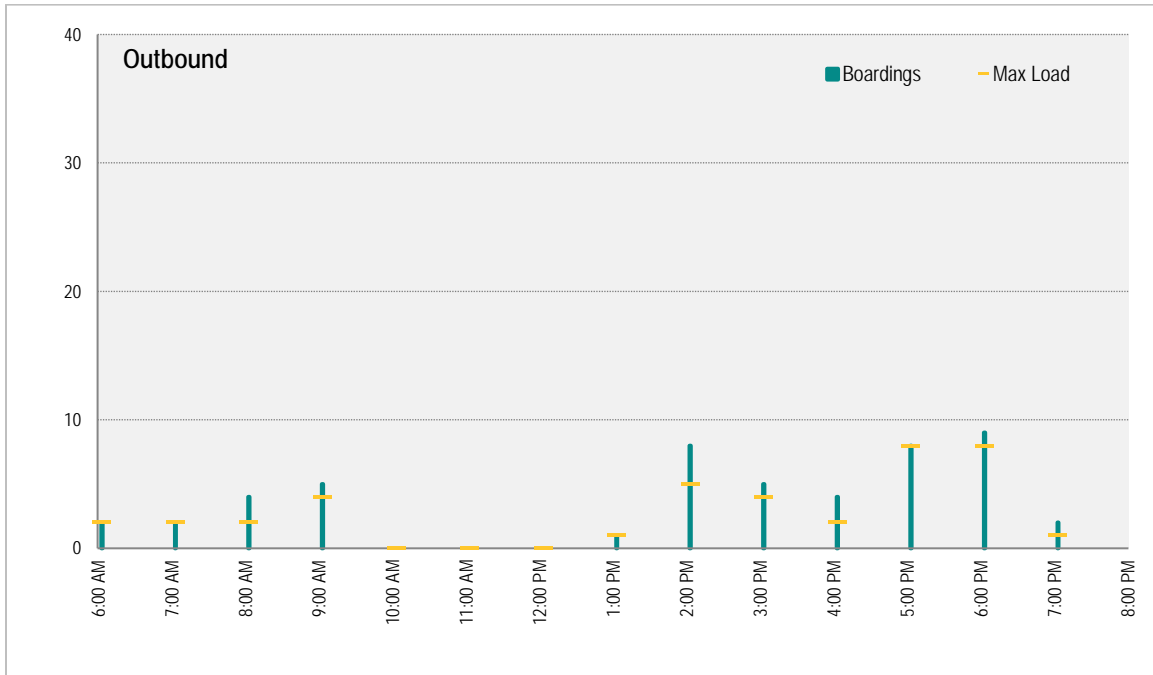
Figure 19 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.

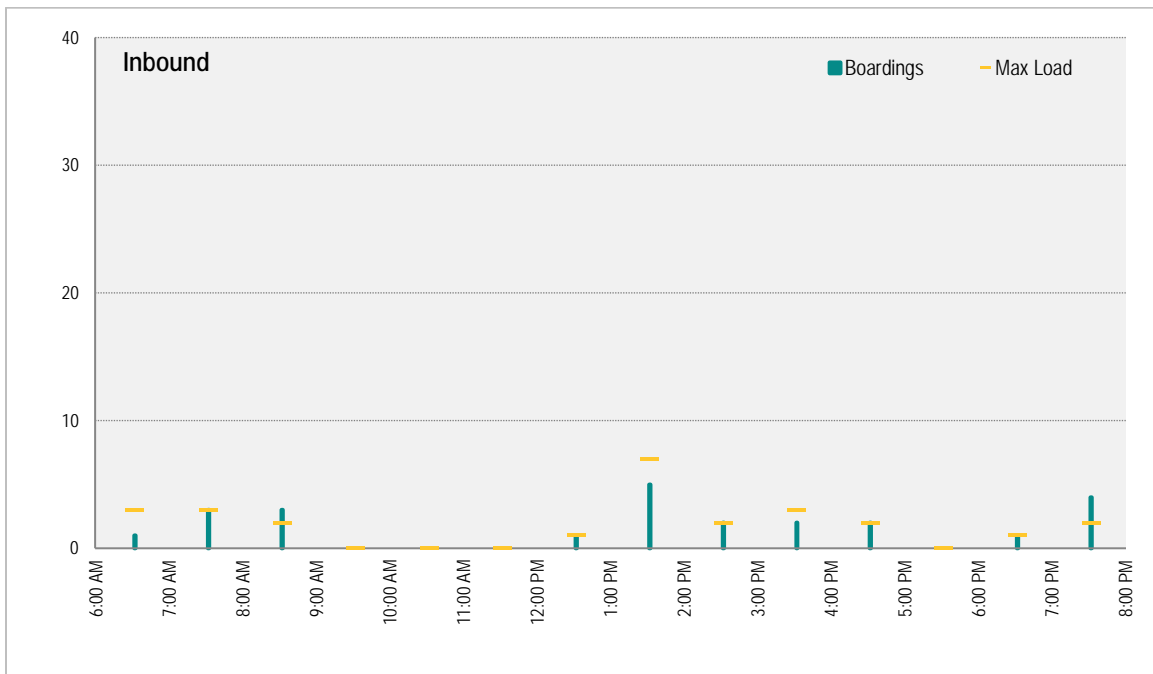
ROUTE EVALUATION | ROUTE 10
Lawrence Transit

Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.

SERVICE PRODUCTIVITY

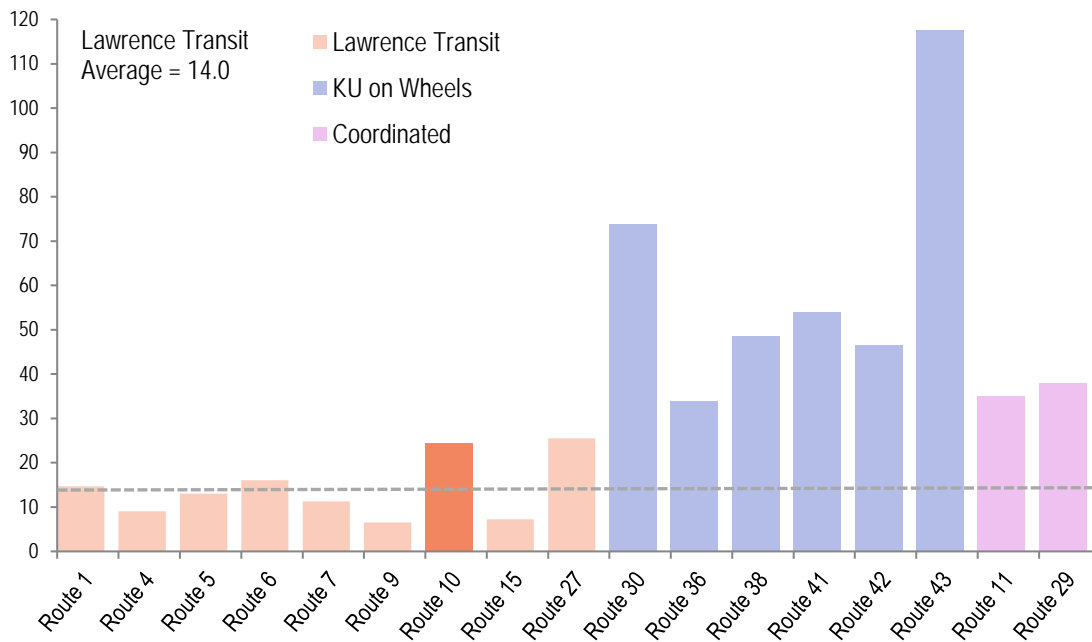
In terms of average passengers per hour, Route 10 is the second most productive Lawrence Transit bus route (Figure 22). The route carries 24.3 passengers per hour on weekdays, exceeding the system average by 74% (Figure 23). Route 10 carries 7.0 passengers per hour on Saturdays (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	338	13.9	24.3	14.0	2 of 9
Saturday	97	13.9	7.0	9.7	6 of 8

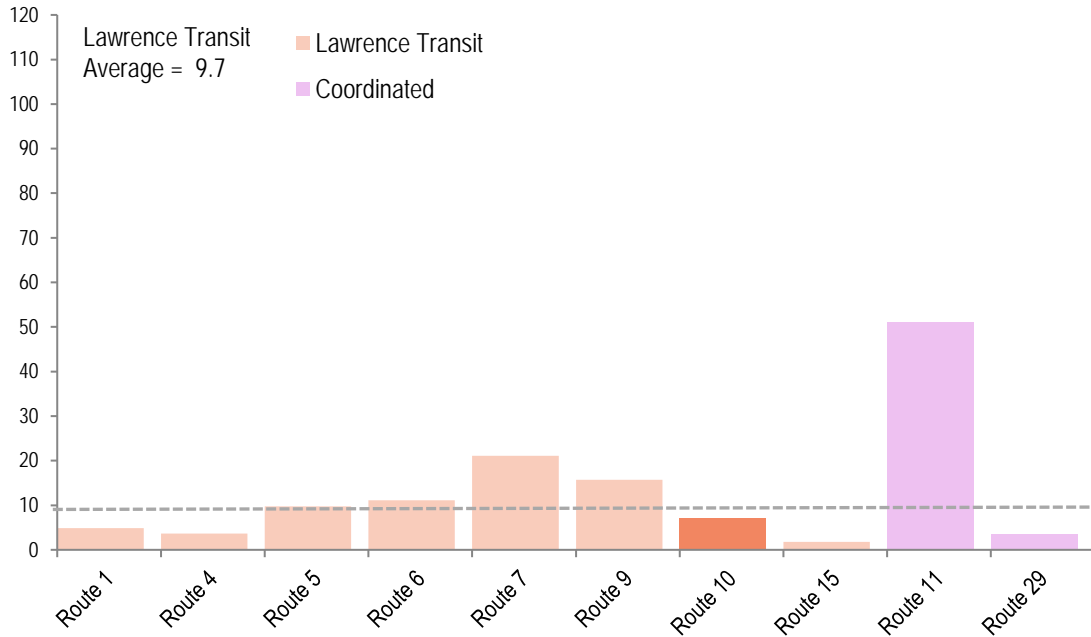
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 58% of Route 10 time points were served “on-time” during the survey period (Figure 25). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule. On Saturdays, approximately 70% of Route 10 time points were served “on-time” during the survey period.

Weekday on-time performance was affected by a high rate of late departures: four outbound time points and six inbound time points recorded delays of 10 minutes or more. On Saturdays, 14% of time points are served early, with buses departing before their scheduled departure time.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	58%	70%
Early	6%	14%
Late	38%	14%

Note: Trip data does not include all time points per trip.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 10 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Extend Service to George Williams Way.** Ridership on Route 10 is clustered around KU, with some additional ridership along Bob Billings Parkway west of KU and at the downtown transit hub. Wakarusa Drive shows weaker ridership. The market analysis shows some demand for service along Bob Billings Parkway past Wakarusa Drive. Removing service along Wakarusa Drive and extending Route 10 west along Bob Billings Parkway to George Williams Way would straighten the route and add service to western Lawrence, including to Corpus Christi Catholic School and Ironwood Court Apartments.
- **Remove Service to Free State High School.** Current cycle time on Route 10 is 57 minutes, leaving little recovery time and potentially causing Route 10's low on-time performance. Ridership is very low at Free State High School, and removing service from the school would affect few riders. Turning the bus around near the corner of Wakarusa Drive and 6th Street, potentially at the Walmart, will allow for a slightly shorter one-way running time.
- **Interline Route 10 with Another Route.** As an alternative to removing service to Free State High School, Route 10 could be interlined with another route to improve its on-time performance. If one route has insufficient running time, and another has running time to spare, operationally linking the routes together can optimize running time and recovery time on both routes. To interline two routes, they must have a common terminus and justify similar levels of service.
- **Begin Service at 7:03 AM; End Service after the 7:03 PM Departure.** Service on Route 10 currently begins at 6:03 AM and ends at 8:00 PM (last departure at 7:32 PM). Low ridership on departures before 7:00 AM and after 7:00 PM indicates that the resources necessary to operate that service could be better spent elsewhere. As a result, reducing the service span to approximately 7:00 AM to 7:00 PM would benefit users in some other way or on some other part of the system.
- **Improve Frequency on Weekdays.** Hourly service is not frequent enough to attract users who have other transportation options. Lawrence Transit has had a goal of improving most routes in the system to a frequency of 30 minutes or less. With Route 10's strong performance compared to other Lawrence Transit's routes, 30-minute frequency on weekdays could further improve ridership by attracting new users and facilitating more trips by current users.

As of August 1, 2016, Route 10 now operates on a 30-minute service frequency Monday through Saturday.

Lawrence Transit System

ROUTE 15

Downtown to the Peaslee Center

SERVICE DESIGN

Route 15 is a radial route that operates between Downtown Lawrence and the East Hills Business Park. The route travels primarily along Connecticut Street, 11th Street, Haskell Avenue, 23rd Street, and Venture Park Drive (Figure 1). Route 15 provides service to the U.S. Post Office, Lawrence Public Library, Lawrence Municipal Court, Douglas County Government Offices, East Lawrence Recreation Center, Central Middle School, Peaslee Technical Training Center, Lawrence Community Shelter, and East Hills Business Park.

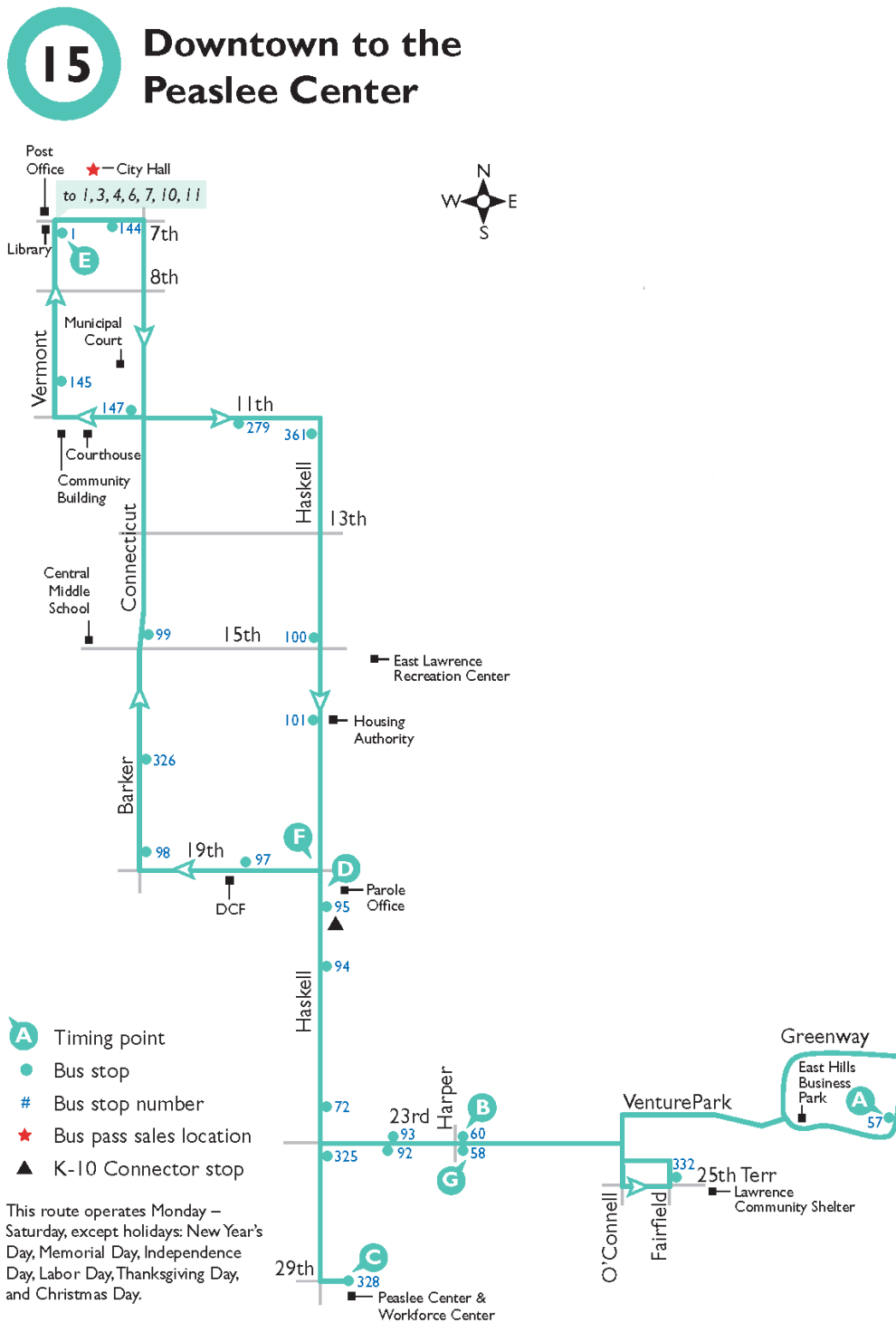
ALIGNMENT/SERVICE PATTERNS

Route 15 has one primary service pattern for Weekday and Saturday service. Departing outbound from the intersection of 7th Street and Vermont Street in Downtown Lawrence, Route 15 turns right on 7th Street, right on Connecticut Street, left on 11th Street, right on Haskell Avenue, left on 29th Street and into the Peaslee Center parking lot. After serving the Peaslee Center, Route 15 turns right on Haskell Avenue, right on 23rd Street, and completes a small loop to serve the Lawrence Community Shelter. After leaving the shelter, Route 15 continues north to reach Venture Park Drive, where it turns right and serves the East Hills Business Park, terminating near the General Dynamics building.

Returning inbound from the General Dynamics building, Route 15 heads west on Venture Park Drive and 23rd Street, south on Haskell Avenue, and turns left on 29th Street to enter the Peaslee Center parking lot. After serving the Peaslee Center, Route 15 turns right on Haskell Avenue, left on 19th Street, right on Barker Avenue, continues onto Connecticut Street, turns left on 11th Street, and right on Vermont Street, terminating just before the intersection with 7th Street.

As of August 1st, 2016, Route 15 serves the East Hills Business Park via a slightly different alignment, no longer serves the Lawrence Community Shelter, and does not operate along Haskell Avenue north of 19th Street. The route operates bi-directionally along Connecticut Street and Barker Avenue.

Figure 1 | Route Map



Source: Lawrence Transit, August 2015-July 2016
New route alignment effective as of August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 15 and several Lawrence Transit routes and routes coordinated with KU on Wheels at the downtown transit hub (7th & Vermont). There are also transfer opportunities at several other points along the route, including on Connecticut Street (Route 1), 23rd Street (Route 5), and Greenway Drive (Route 5). Transfer opportunities to the K-10 Connector are also available on Haskell Avenue (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Downtown Transit Hub	Route 1, Route 3, Route 4, Route 6, Route 7, Route 10, and Route 11
Haskell Avenue and 23rd Street	Route 1, Route 5
23rd Street and Harper	Route 1, Route 5

SERVICE SCHEDULE

Route 15 operates from Monday–Saturday year round (Figure 3). On weekdays and Saturdays, the route runs every 60 minutes from 6:30 AM to 7:55 PM. Route 15 does not run on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday–Friday	6:34 AM – 7:55 PM	60	14/14
Saturday	6:34 AM – 7:55 PM	60	14/14
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 15 ranks eighth of nine Lawrence Transit routes in terms of weekday ridership and eight of nine in terms of ridership per weekday trip (Figure 4). On average, the route carries 100 weekday passengers, or 3.6 passengers per trip, on Monday–Friday (Figure 5 and Figure 6). On Saturdays, Route 15 carries 20 passengers, or 0.7 passengers per trip (Figure 7 and Figure 8).

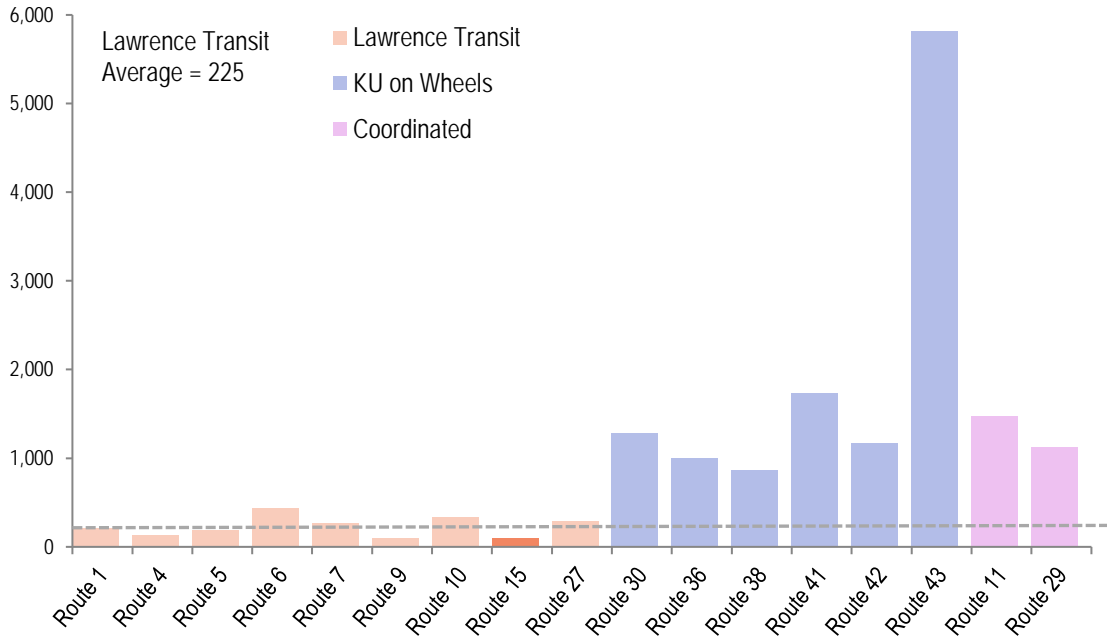
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	100	28	3.6	6.5	8 of 9
Saturday	20	28	0.7	4.7	8 of 8

Source: Lawrence Transit, 2016

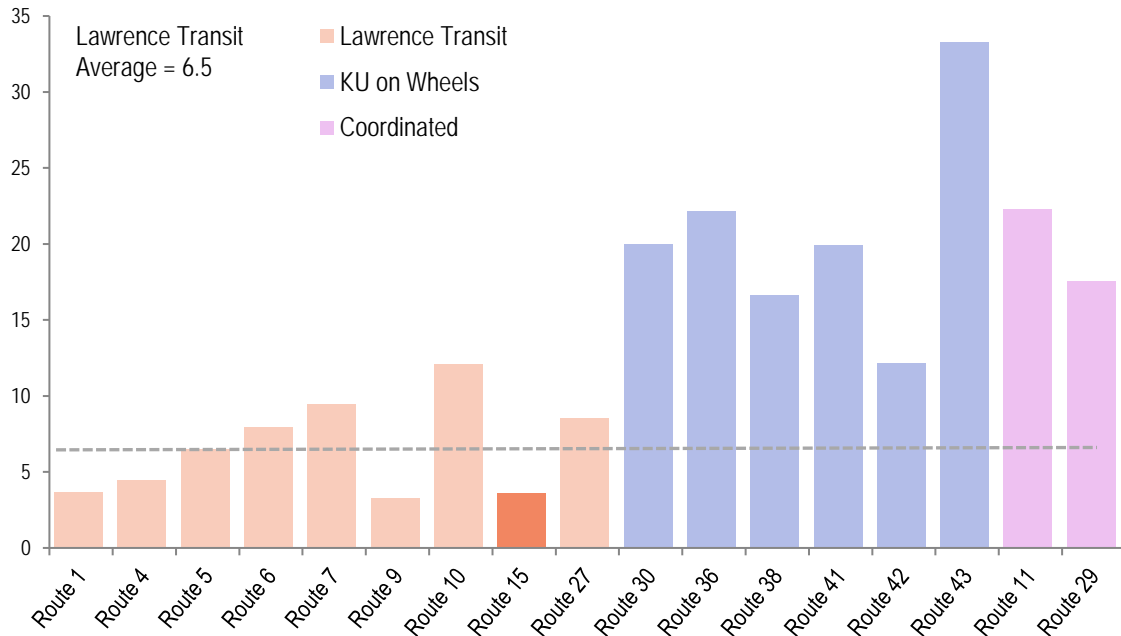
ROUTE EVALUATION | ROUTE 15
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

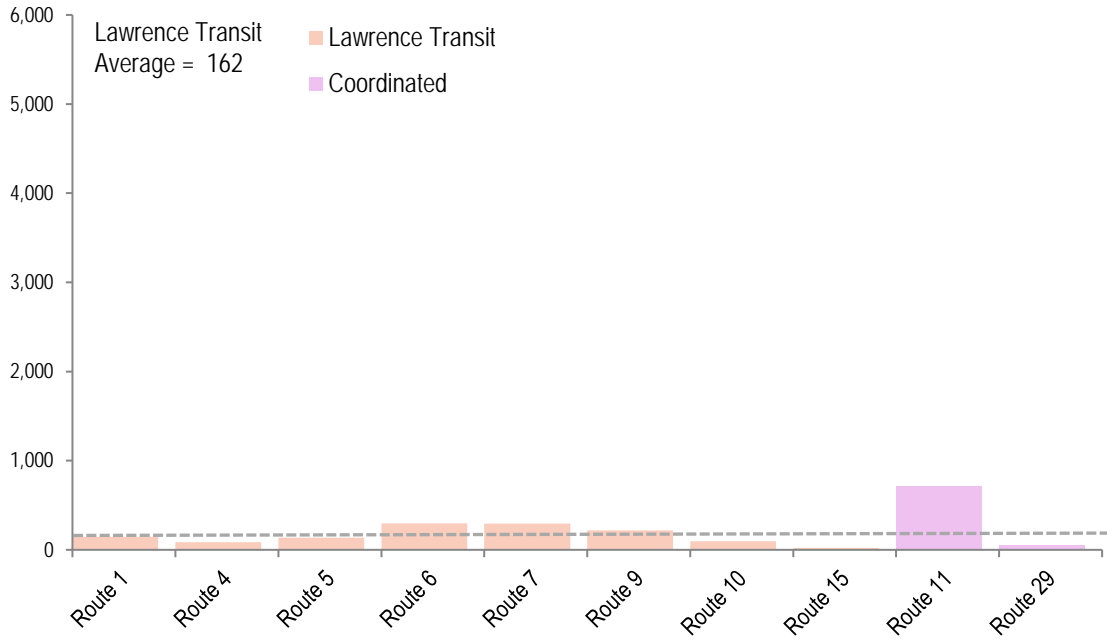
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

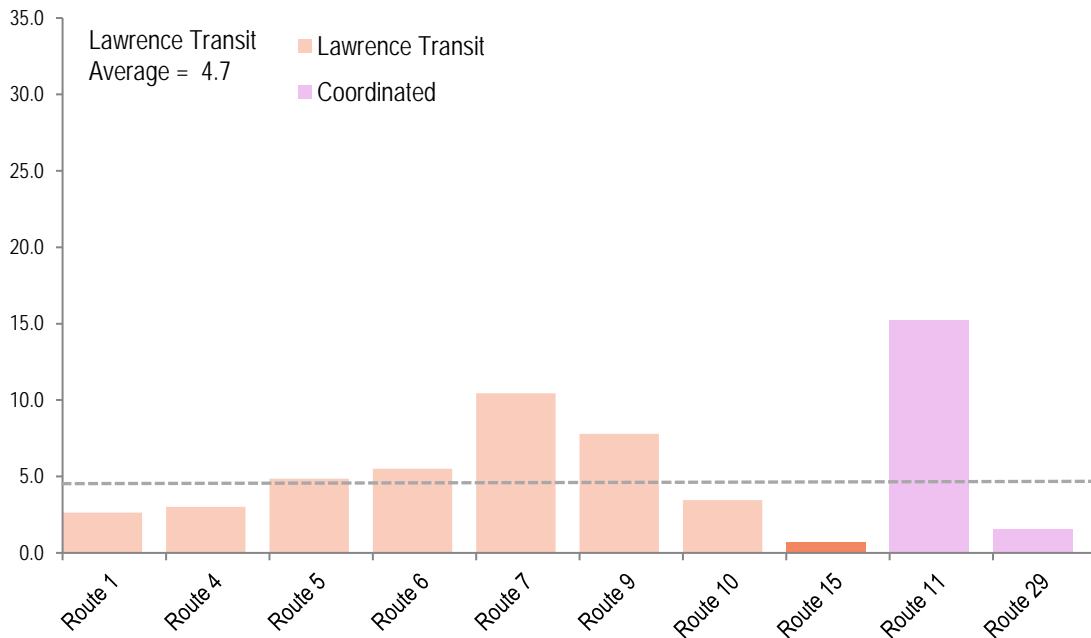
ROUTE EVALUATION | ROUTE 15
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 15 inbound are the final two stops, located near downtown Lawrence (Figure 9). The route’s terminating stop at 7th Street and Vermont Street generates the highest combined boardings and alightings. Only one other stop has more than 10 boardings and alightings per weekday: 10th Street and Vermont Street. These stops serve a mix of commercial, residential, and institutional destinations. All other stops serve fewer than ten boardings and alightings (Figure 10-Figure 13). Traveling outbound, the stop at 25th Terrace and Fairfield—near the Douglas County Jail and Lawrence Community Shelter—generates the highest number of combined boardings and alightings apart from the downtown transit hub.

Similar patterns exist on Saturday (Figure 14-Figure 17). The outbound stop at 25th Terrace and Fairfield generates a combined 50 boardings and alightings. Traveling inbound, the terminating stop downtown generates the highest ridership (24 alightings), while the stop at 11th Street and Connecticut Street generates the second-highest ridership, with 15 combined boardings and alightings.

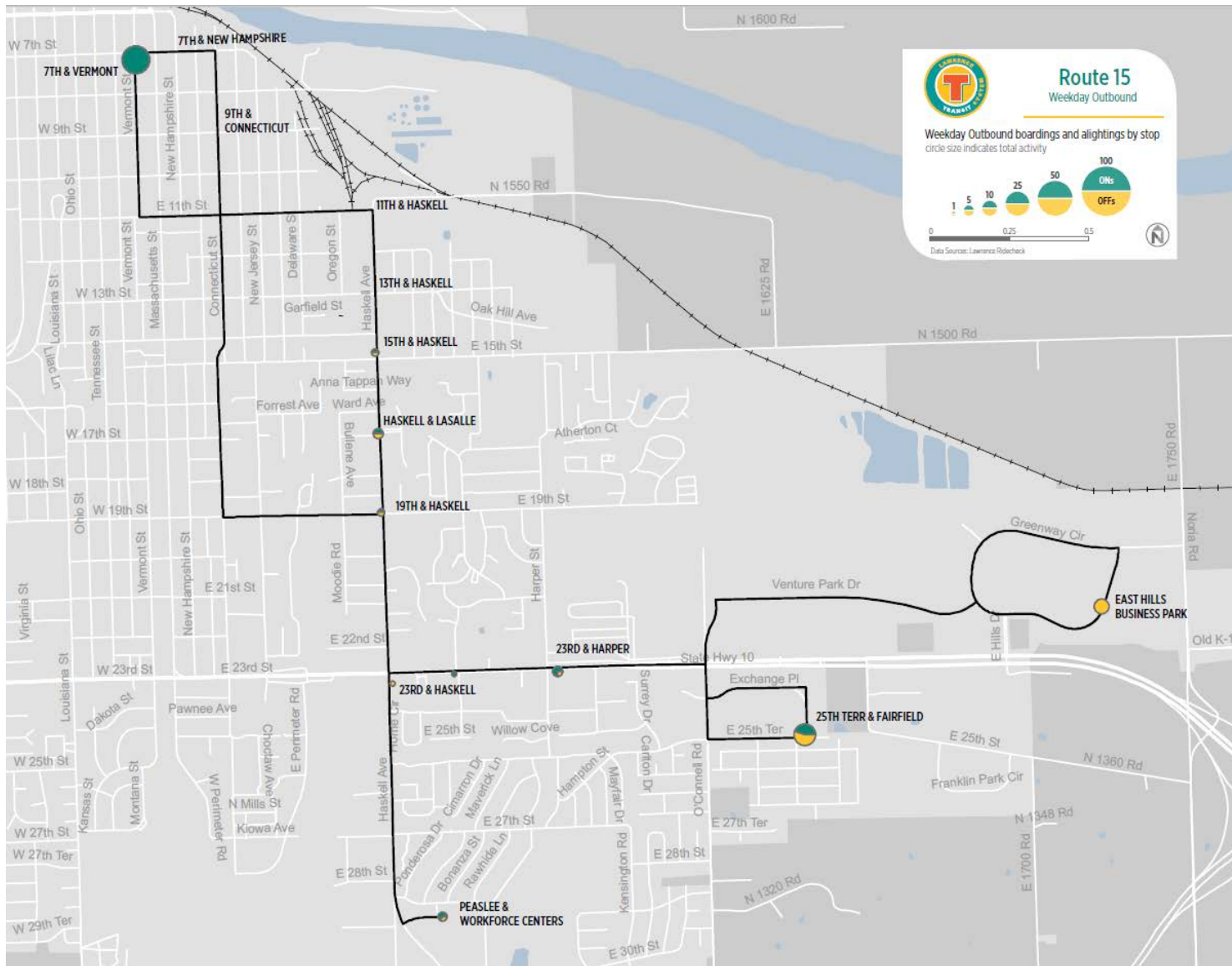
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
7th Street / Vermont Street	29	Downtown Lawrence; Lawrence Public Library; Buford M. Watson Jr. Park
10th Street / Vermont Street	11	Downtown Lawrence; Local retail stores
11th Street / Connecticut Street	6	Douglas County District Court; Motor Vehicle Registration; Residential neighborhood
East Hills Business Park	6	East Hills Business Park
23rd Street / Haskell Avenue	5	Local retail stores; Haskell Indian Nations University

*Weekday inbound ridership (boardings and alightings) for Route 15 only

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

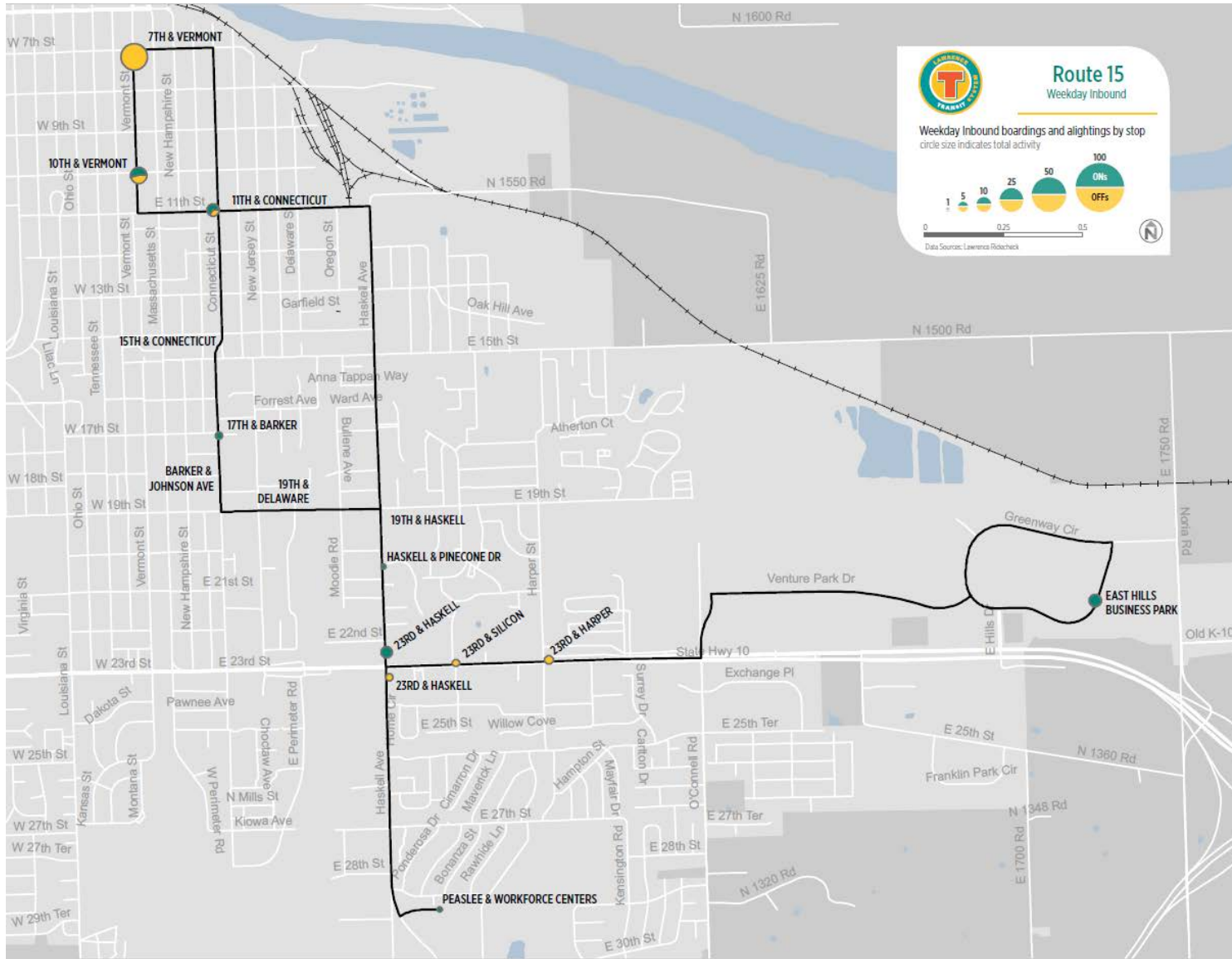
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

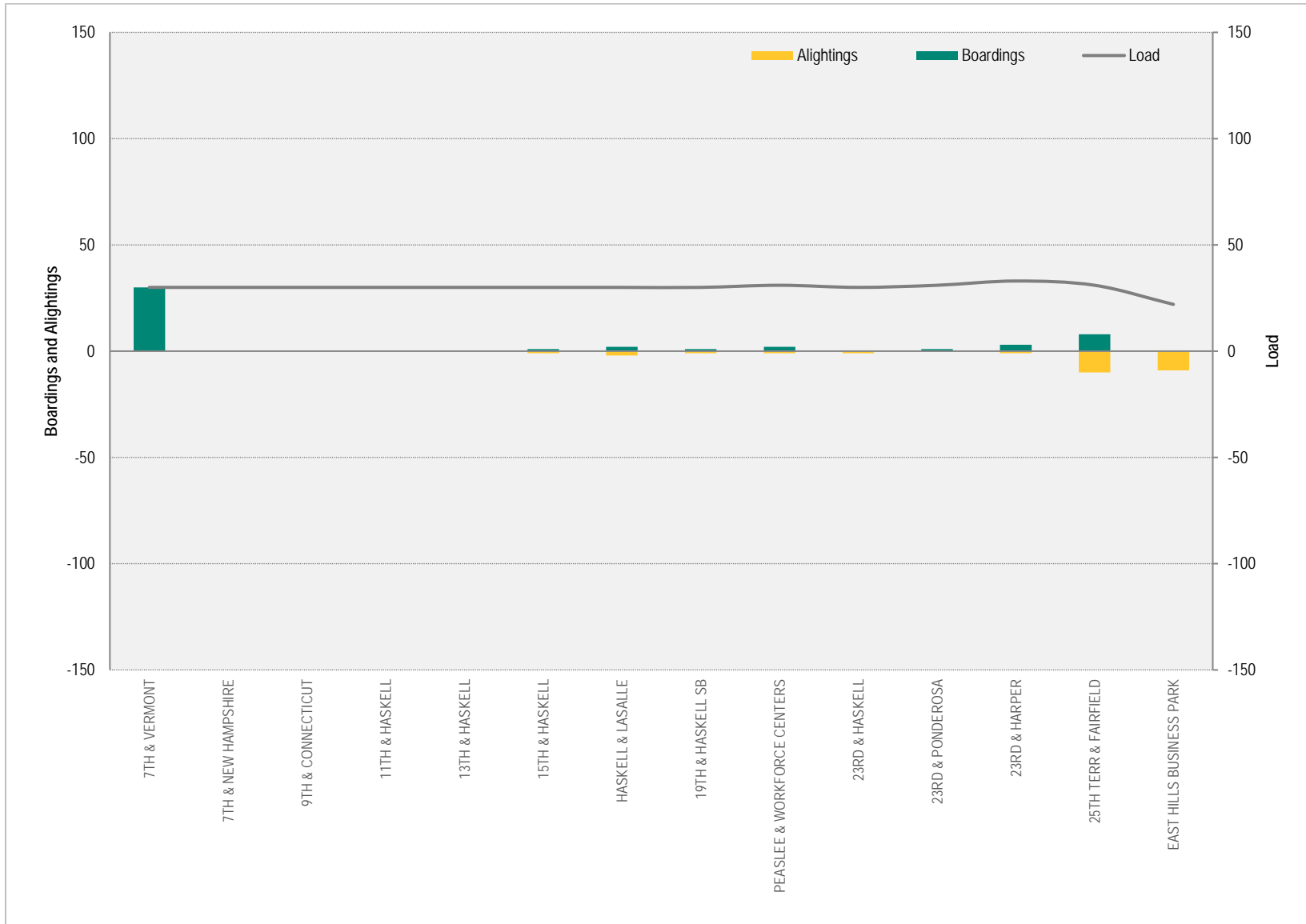
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

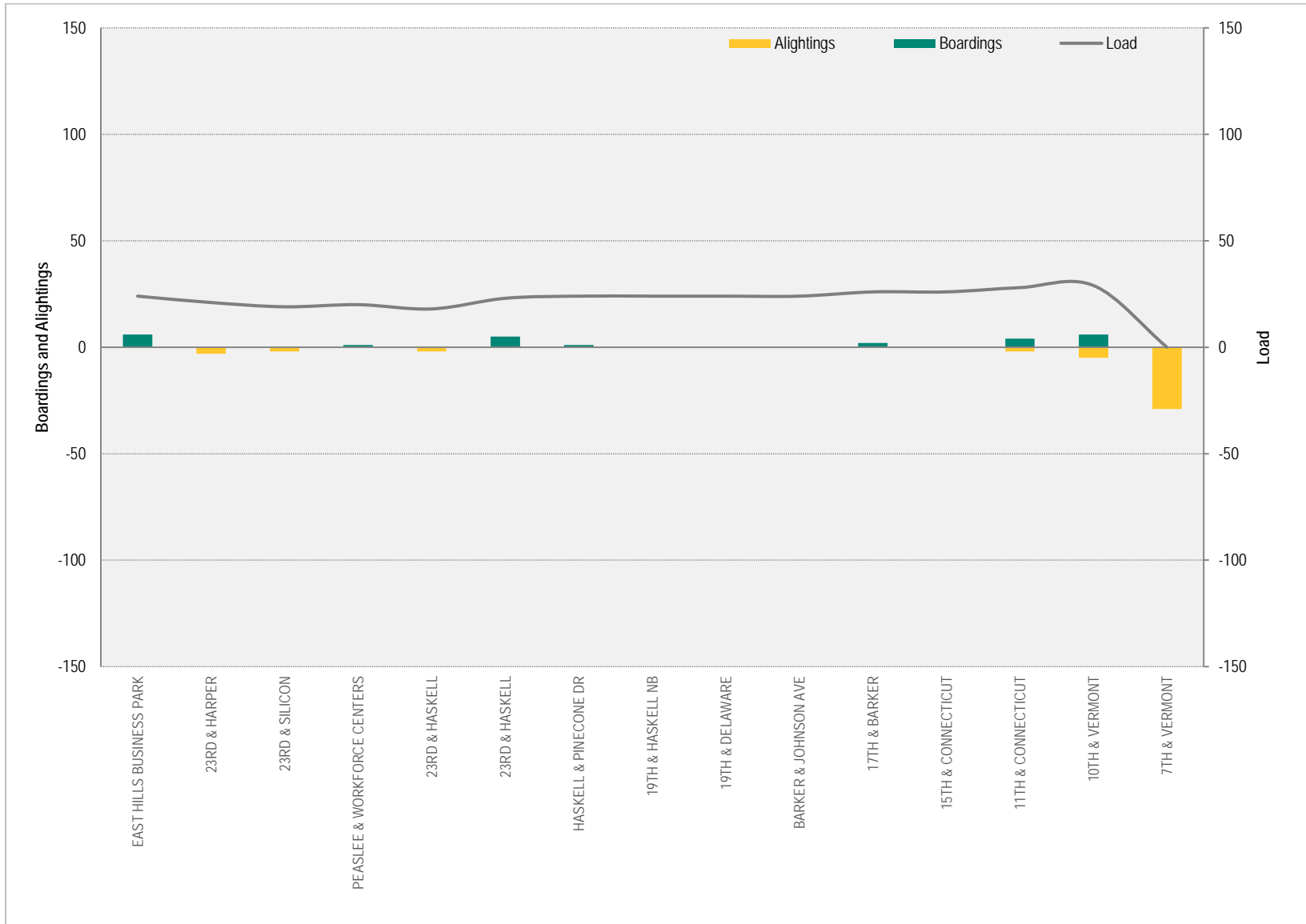
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

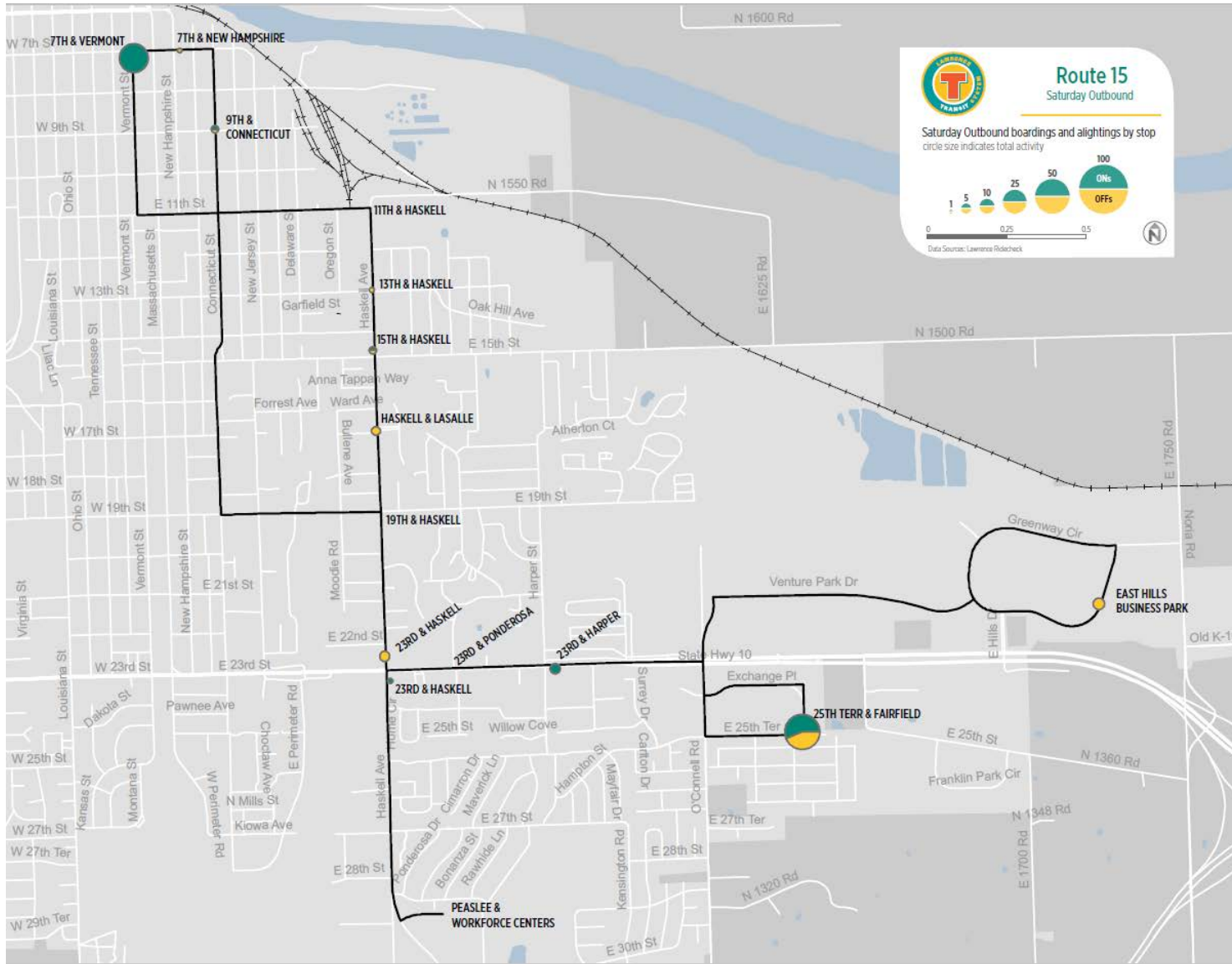
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

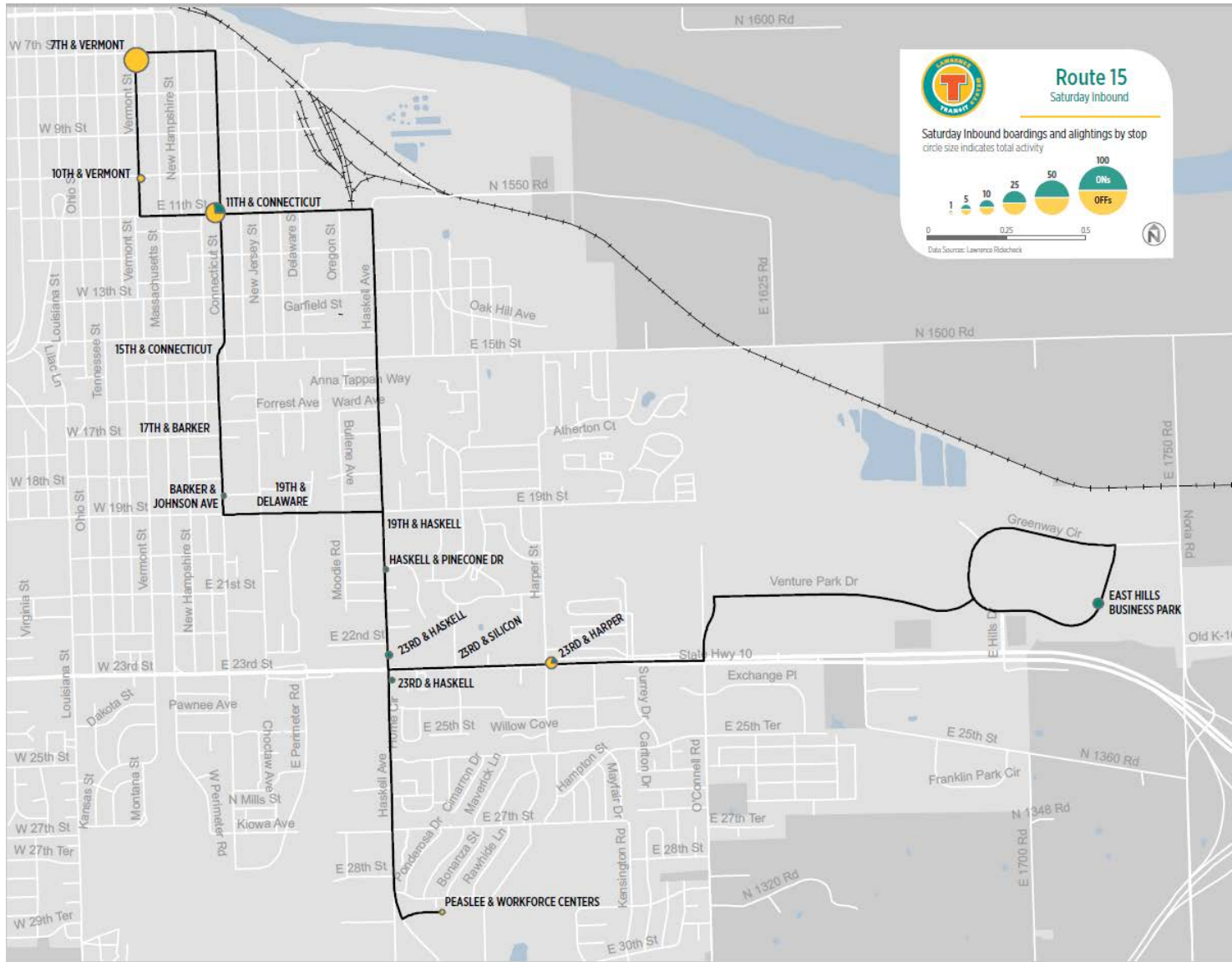
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

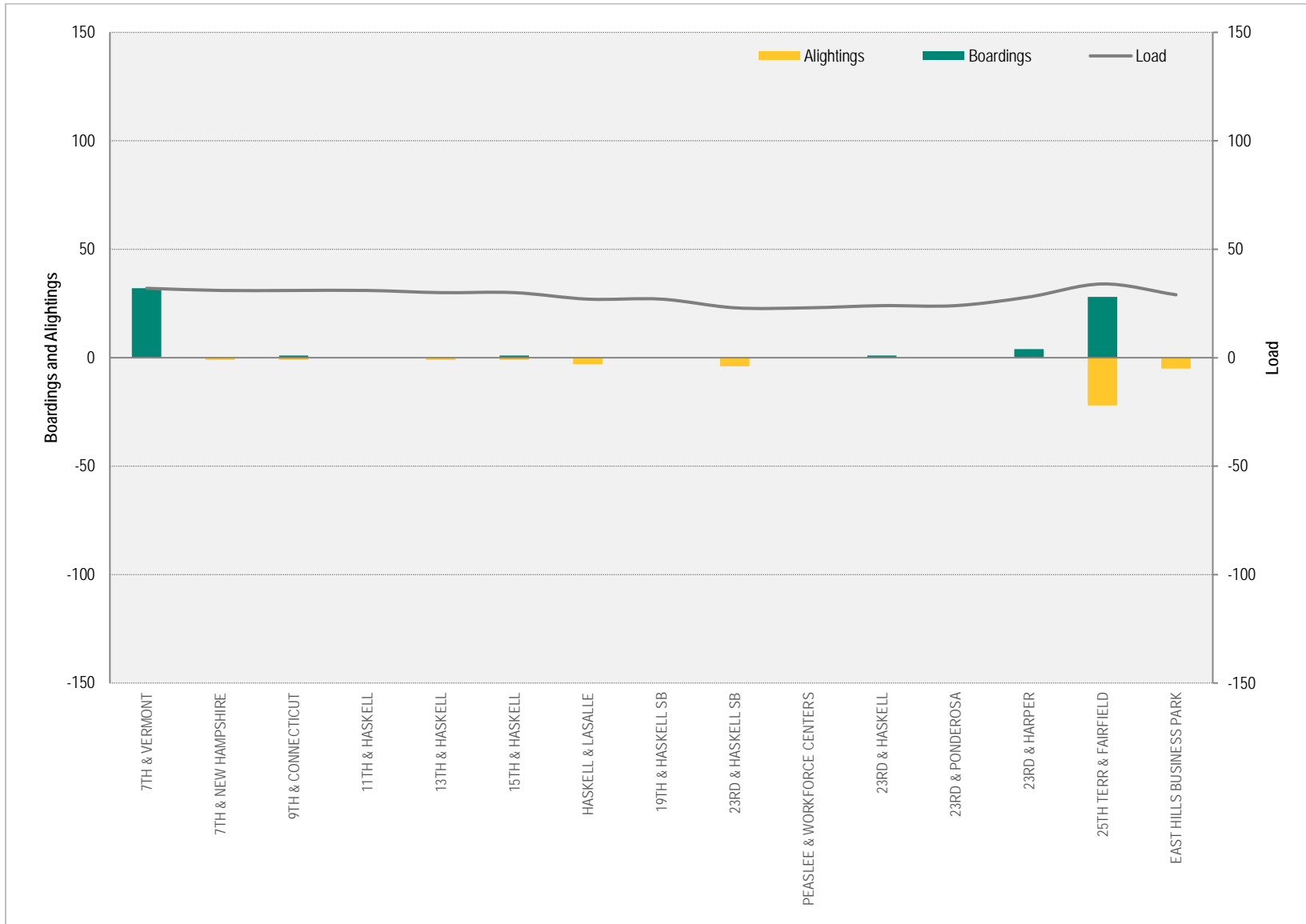
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

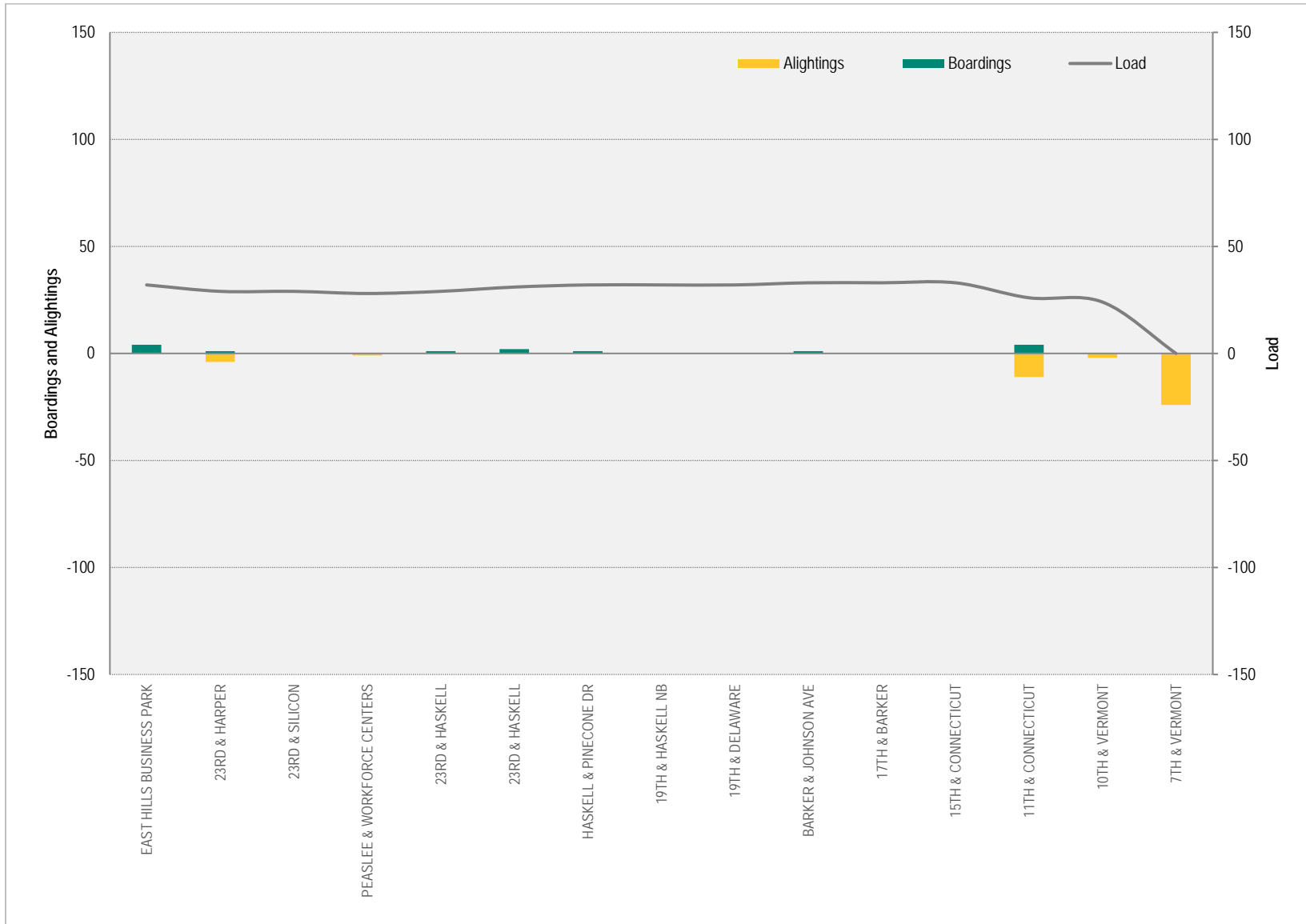
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 15
Lawrence Transit

Figure 17 | Saturday Inbound Ridership by Stop Chart



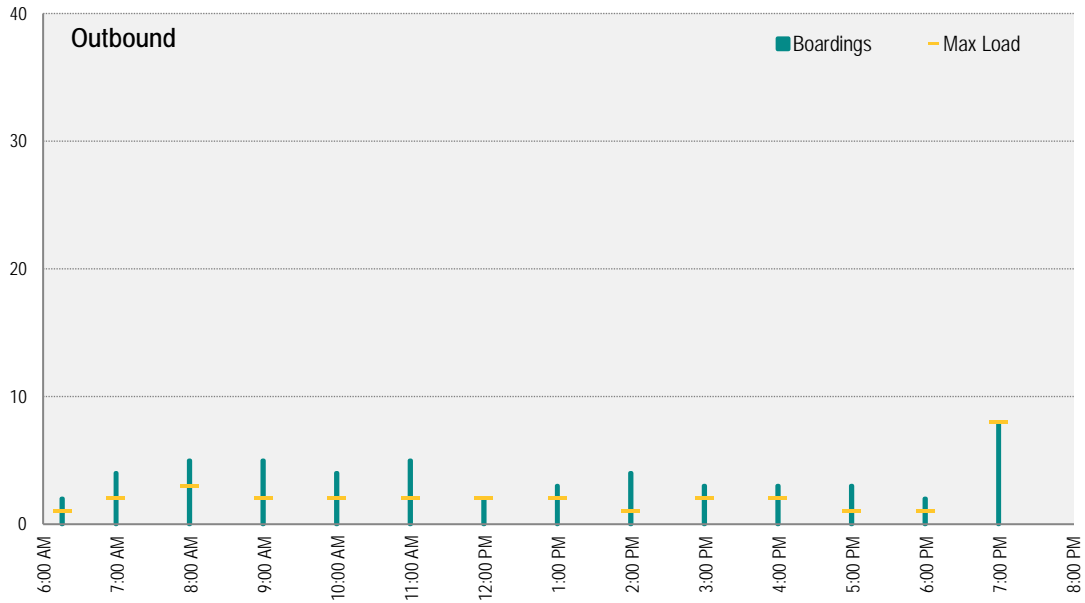
Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

On weekdays, Route 15 ridership is low throughout the day, with no trips carrying more than 10 passengers. Ridership is highest during the evening (traveling outbound) and the afternoon (traveling inbound) and (Figure 18 and Figure 19). During these periods, ridership peaks at 7:00 PM on outbound trips (eight passengers) and at 3:34 PM on inbound trips (seven passengers).

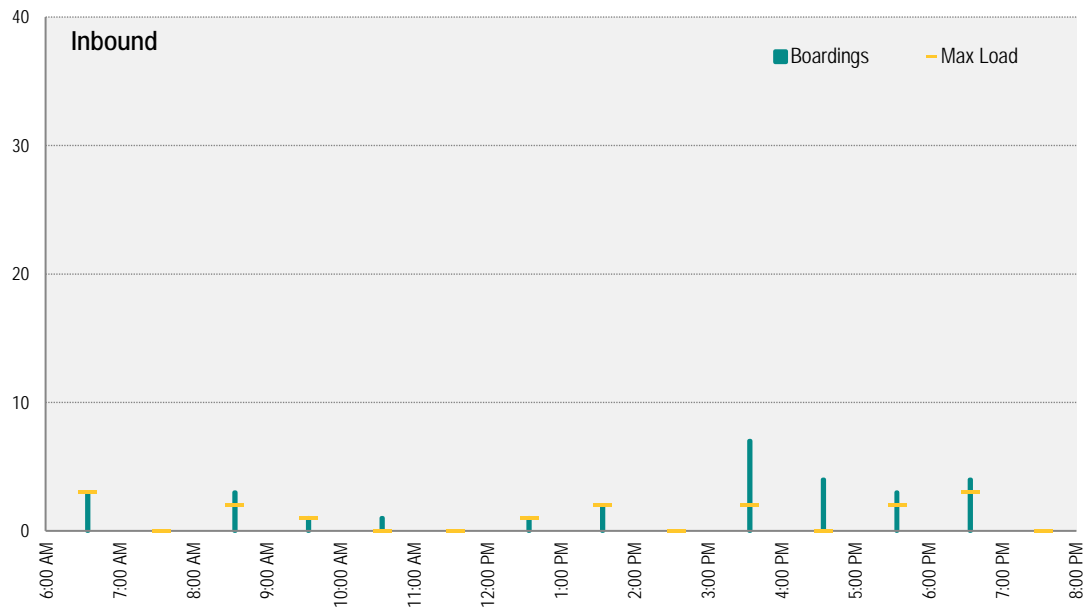
On Saturdays, Route 15 ridership is highest between 2:00 and 6:00 PM in the outbound direction (Figure 20 and Figure 21). During this period, ridership peaks at 2:00 PM, carrying 15 passengers, but two additional trips carry nine or more passengers. Ridership traveling inbound is minimal, with no trips carrying more than five passengers.

Figure 18 | Weekday Outbound Ridership by Trip Chart



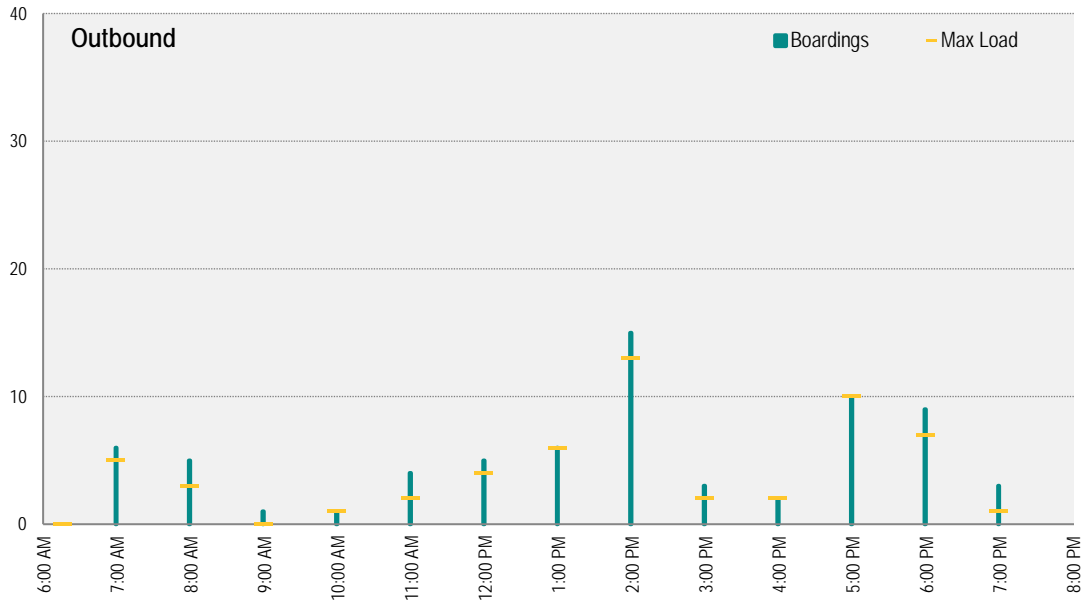
Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart



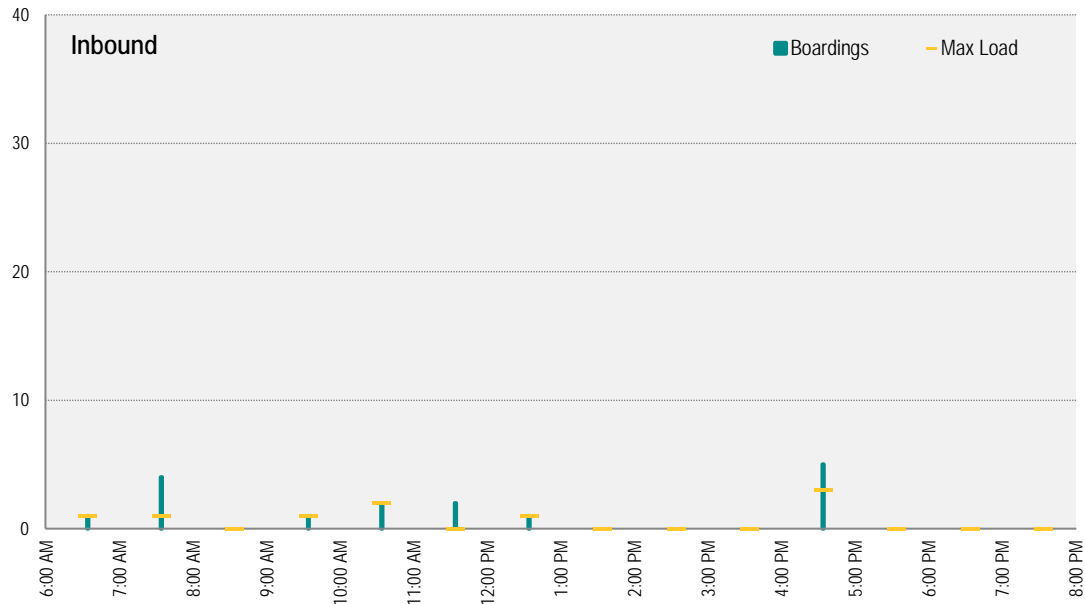
Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

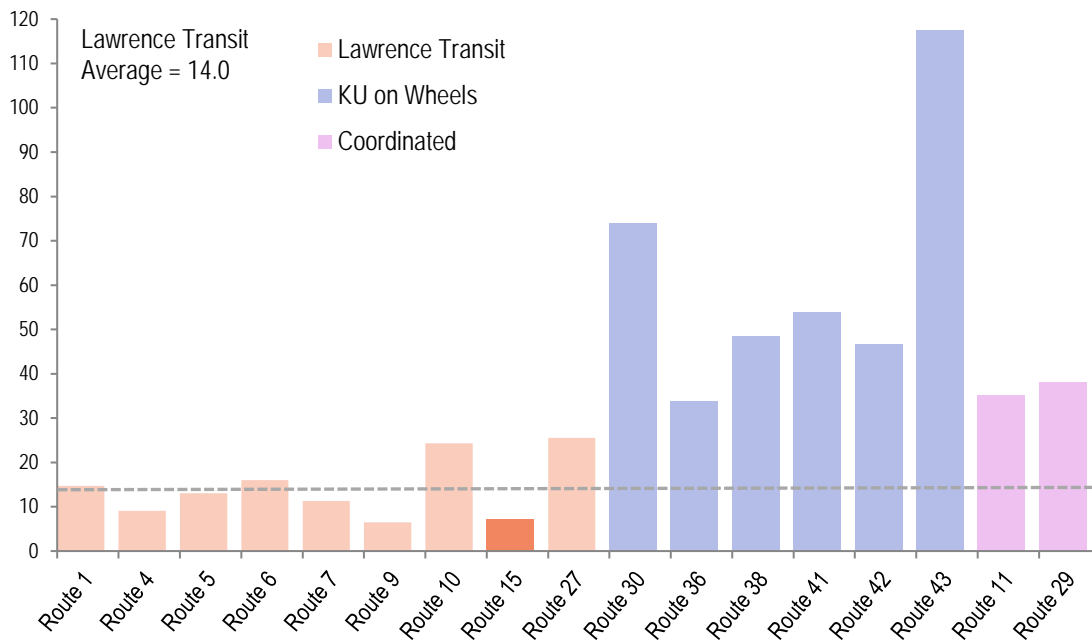
In terms of average passengers per hour, Route 15 is the eighth most productive Lawrence Transit bus route (Figure 22). The route carries 7.2 passengers per hour on weekdays, 49% less than the system average (Figure 23). Route 15 carries 1.4 passengers per hour on Saturdays, the lowest systemwide average (Figure 24). Low Saturday ridership may be attributable to the drop in commuter passengers that work at East Hills Business Park and use the route on weekdays.

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	100	13.9	7.2	14.0	8 of 9
Saturday	20	13.9	1.4	9.7	8 of 8

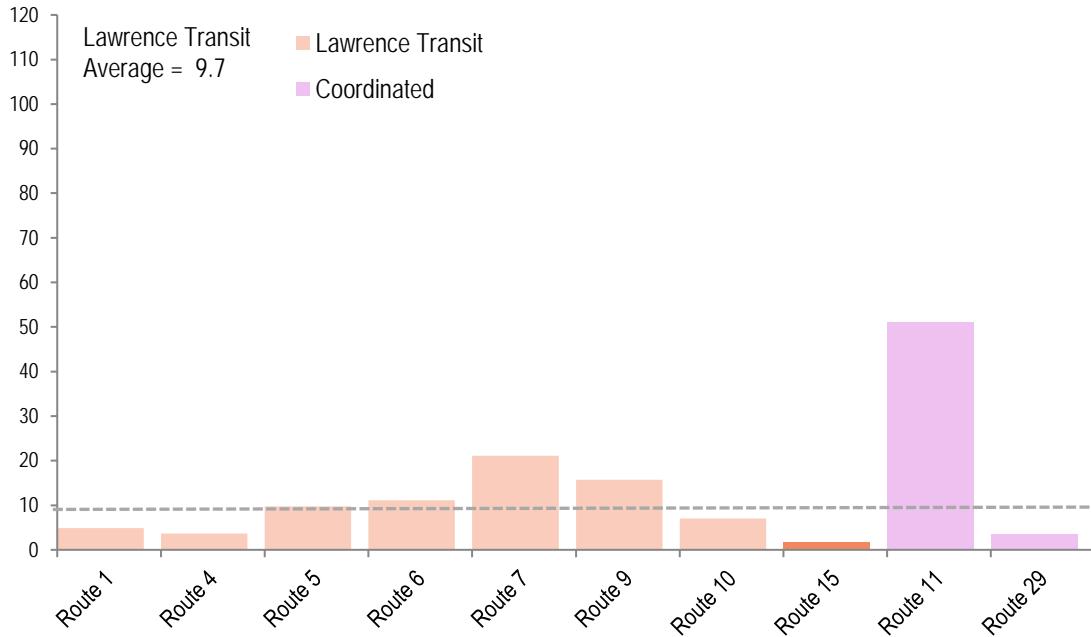
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 61% of Route 15 time points were served “on-time” during the survey period (Figure 25). On Saturdays, approximately 45% of Route 15 time points were served “on-time” during the survey period.” Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected primarily by late departures, with nearly a third of time points served later than scheduled. Saturday on-time performance was affected by both late and early departures, with over half of departures not served on-time.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	61.2%	44.7%
Early	6.1%	18.1%
Late	32.7%	37.2%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 15 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Remove one-way loops.** Most ridership on Route 15 occurs at either end of the route. One-way loops tend to make service less useful to riders, and less effective overall, because trips are only convenient in one direction. To simplify Route 15, service can be provided bi-directionally along one of its current directional alignments.

As of August 1st, 2016, Route 15 no longer serves the Lawrence Community Shelter and operates bi-directionally along Connecticut Street, Barker Avenue, and 19th Street, thus removing one-way service entirely and simplifying the route.

- **Reduce redundancy.** Route 15 has significant overlap with Route 1, with both routes operating outbound along Connecticut Street and Haskell Avenue, and inbound along Barker Avenue and Vermont Street. Splitting this alignment, so that one route operates bi-directionally along one set of streets and the other operates bi-directionally along the other set of streets will simplify both routes, reduce redundancy, and make transit service more appealing to riders along corridors that are currently served in one direction only.

The recent changes to Route 15 have reduced redundancy with Route 1, with each route now operating bi-directionally along a unique set of streets.

- **Begin Service at 6:33 AM; End Service after the 7:00 PM Departure.** Service on Route 15 currently begins at 6:00 AM and ends at 7:56 PM (last departure at 7:33 PM). Low ridership on departures before 6:33 AM and after 7:00 PM indicate that the resources necessary to operate that service could be better spent elsewhere. As a result, reducing the service span to approximately 6:30 AM to 7:00 PM would benefit users in some other way or on some other part of the system.
- **Remove Saturday Service on Route 15.** Ridership on Route 15 is low, especially on Saturdays. Route 15 adds transit coverage to eastern Lawrence, but the route's utilization patterns indicate that riders use the route primarily to reach the jail, community shelter, or East Hills Business Park. While the jail and community shelter may receive visitors on weekends, activity at the business park likely falls. Removing weekend service would affect few users.
- **Improve Frequency on Weekdays.** Hourly service is not frequent enough to attract users who have other transportation options. Lawrence Transit has had a goal of improving most routes in the system to a frequency of 30 minutes or less. As the only service between downtown and the East Hills Business Park, 30-minute service could help attract new users and facilitate more trips by current users.
- **Remove Service to the Peaslee Technical Training Center and 27th Street.** The Peaslee Technical Training Center generates little weekday or Saturday ridership. Removing the spur to Peaslee and operating along 23rd Street will shorten the route's overall length and cycle time traveling in both the outbound and inbound directions.
- **Consider Interlining Route 15 with Another Lawrence Transit Route.** As Route 15 originates and terminates in downtown Lawrence, the route could be interlined with another route leaving from downtown to create more one-seat ride opportunities. Interlining Route 15 with another route could also help improve its on-time performance by optimizing cycle time and recovery time.

Lawrence Transit System

ROUTE 27

KU to Haskell Indian Nations University

SERVICE DESIGN

Route 27 is a Lawrence Transit route that operates between Snow Hall on the KU Main Campus and Haskell Indian Nations University. The route travels primarily along Jayhawk Boulevard, Naismith Drive, 19th Street, Louisiana Street, and 23rd Street (Figure 1). Route 27 connects the KU Main Campus to Haskell Indian Nations University (HINU), and also serves Lawrence High School and apartment complexes and shopping centers southwest of the intersection of 23rd Street and Louisiana Street.

ALIGNMENT/SERVICE PATTERNS

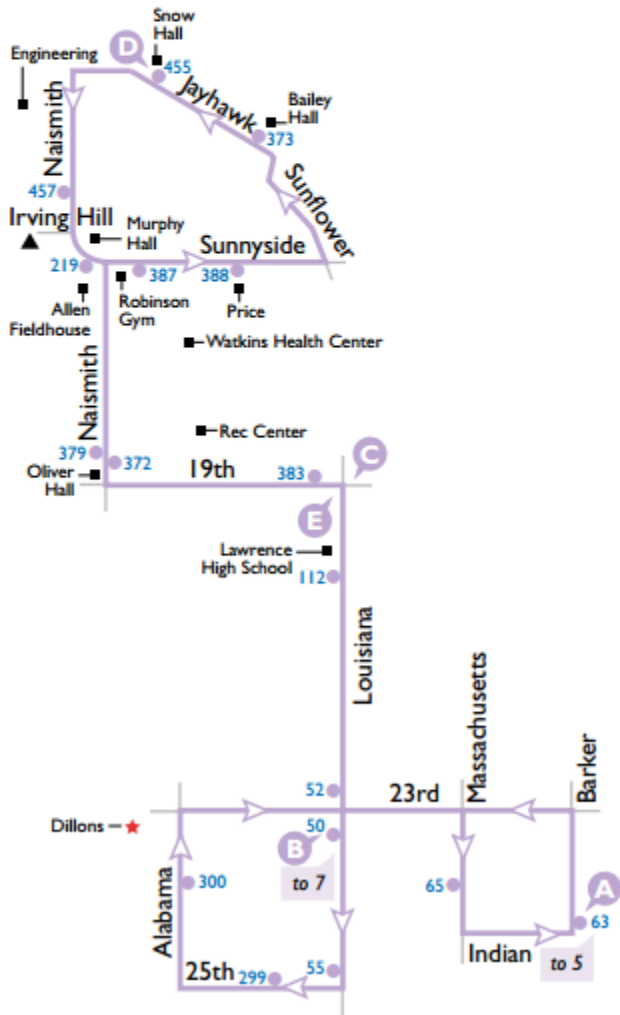
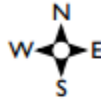
Route 27 has a single consistent service pattern for weekday service. Departing outbound from Snow Hall, Route 27 turns left on Naismith Drive, left on 19th Street, right on Louisiana Street, right on 25th Street, right on Alabama Street, right on 23rd Street, right on Massachusetts Street, and left on Indian Avenue before terminating at Haskell Indian Nations University.

Returning inbound from Haskell Indian Nations University, Route 27 turns left on 23rd Street, turns left on Louisiana Avenue, right on 25th Street, right on Alabama Street, right on 23rd Street, left on Louisiana Avenue, and then continues along the outbound alignment to the intersection of Naismith Drive and Sunnyside Avenue. At this intersection, Route 27 inbound service turns right on Sunnyside Avenue, and turns left on Sunflower Road, left on Jayhawk Boulevard, and terminates at Snow Hall.

Figure 1 | Route Map

27 KU to Haskell Indian Nations University

- A** Timing point
- Bus stop
- # Bus stop number
- ▲ K-10 Connector stop
- ★ Bus pass sales location



Source: Lawrence Transit, August 2015-July 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 27 and several Lawrence Transit and KU on Wheels routes at Snow Hall, 23rd Street and Louisiana Street, and Haskell Indian Nations University. Transfer opportunities exist at several points along Naismith Drive (Route 3 and Route 38); transfer opportunities to the K-10 Connector, operated by Johnson County Transit, are also available on Naismith Drive (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Snow Hall	Route 10, Route 11, Route 29, Route 30, Route 36, Route 38, Route 41, Route 42, Route 43
23rd Street and Louisiana Street	Route 7
Haskell Indian Nations University	Route 5

SERVICE SCHEDULE

Route 27 operates service Monday-Friday when KU is in session (Figure 3). On weekdays, the route runs every 40 minutes from 7:05 AM to 6:22 PM. Route 27 does not run on Saturdays or Sundays, or when KU is not in session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	7:05 AM – 6:22 PM	40	17/17
Saturday	No service	–	–
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 27 ranks third of nine Lawrence Transit routes in terms of weekday ridership and third of nine in terms of ridership per trip (Figure 4). On average, the route carries 289 passengers, or 8.5 passengers per trip, on Monday-Friday (Figure 5 and Figure 6).

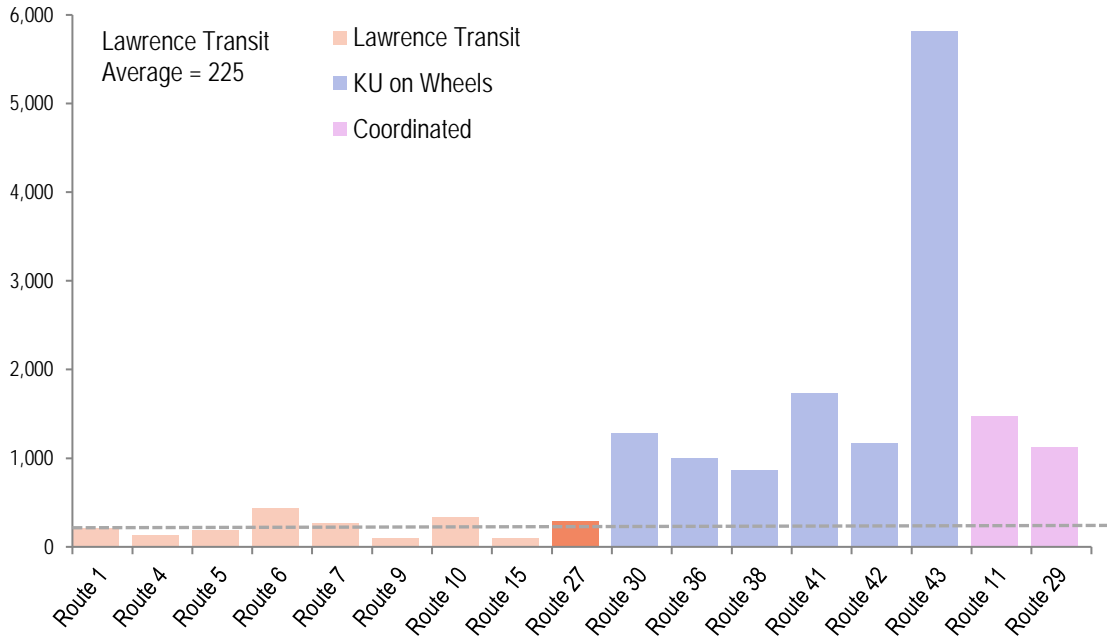
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TYPICAL DAILY TRIPS	AVERAGE RIDERSHIP PER TRIP	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	289	34	8.5	6.5	3 of 9

Source: Lawrence Transit, 2016

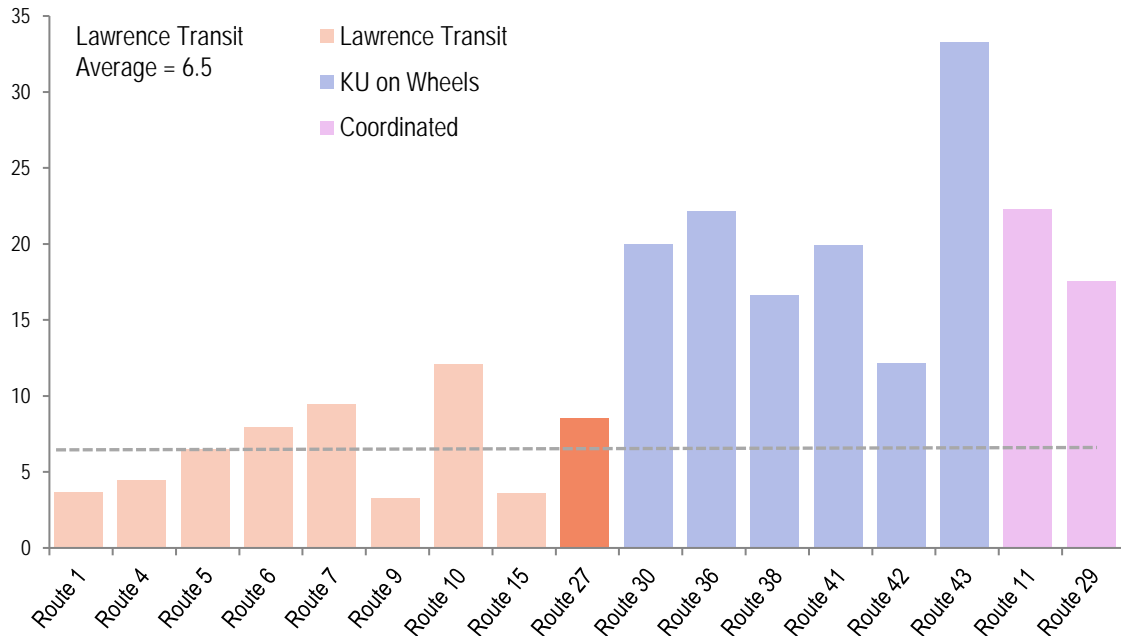
ROUTE EVALUATION | ROUTE 27
Lawrence Transit

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

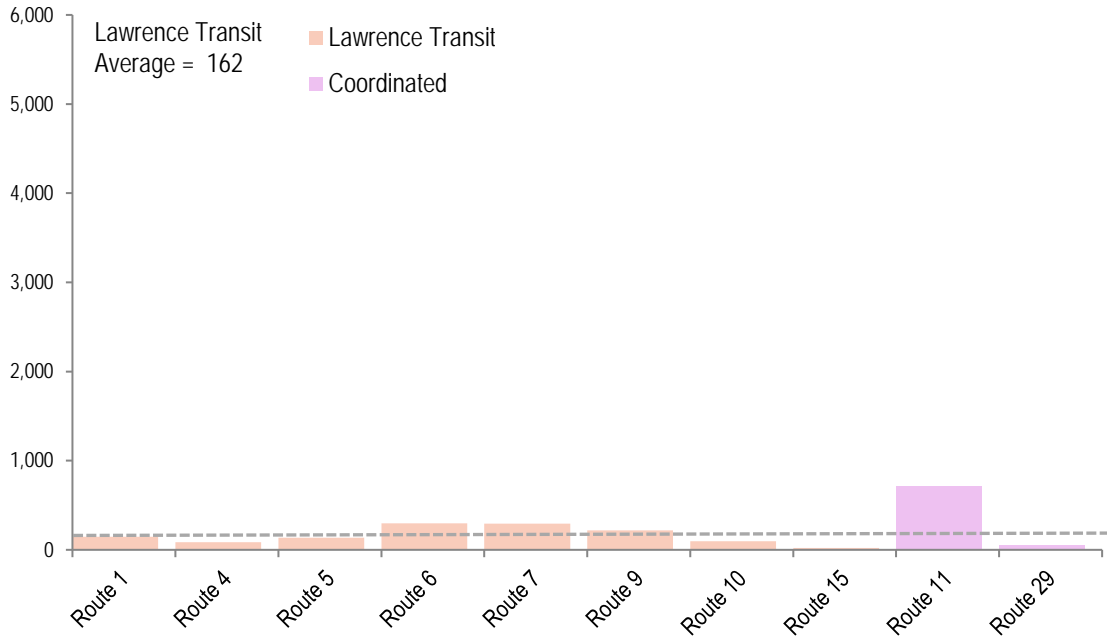
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

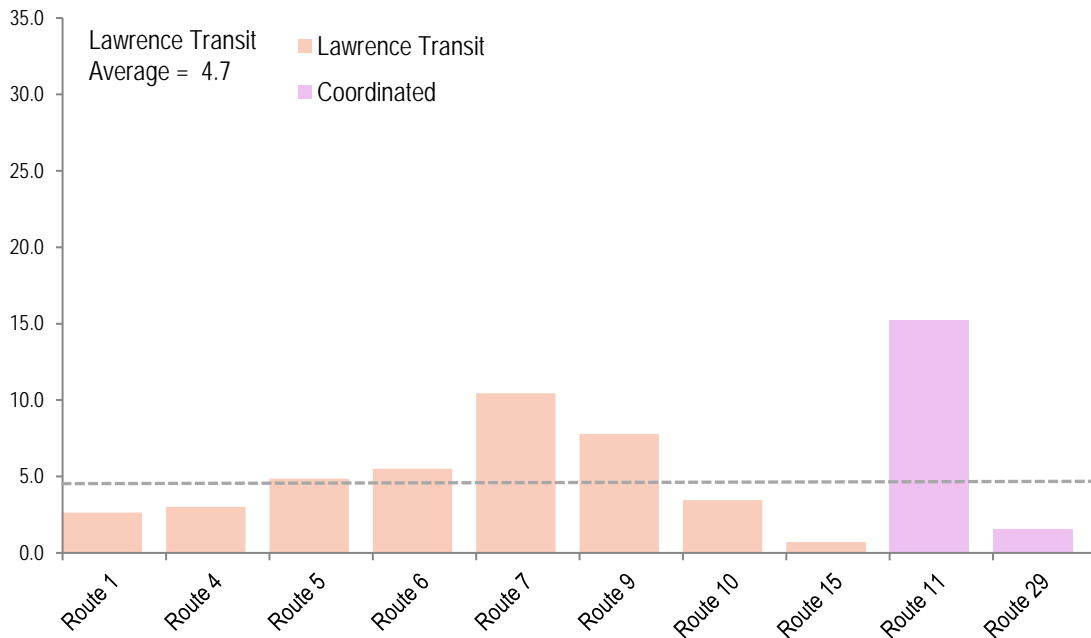
ROUTE EVALUATION | ROUTE 27
Lawrence Transit

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 27 are located on KU’s campus (Figure 9). The stop at Bailey Hall generates the highest combined boardings and alightings (63 passengers), while stops at Robinson Gym and Snow Hall each generate more than 30 passengers. Other stops with more than 10 boardings include stops at 19th Street and Naismith Drive, Malls Olde English Apartments, 19th Street and Alabama Street, 24th Street and Alabama Street, 25th Street and Belle Haven Drive, and KU’s Computer Center. These stops primarily serve academic and commercial destinations. All other stops serve fewer than 10 combined boardings and alightings (Figure 10- Figure 13).

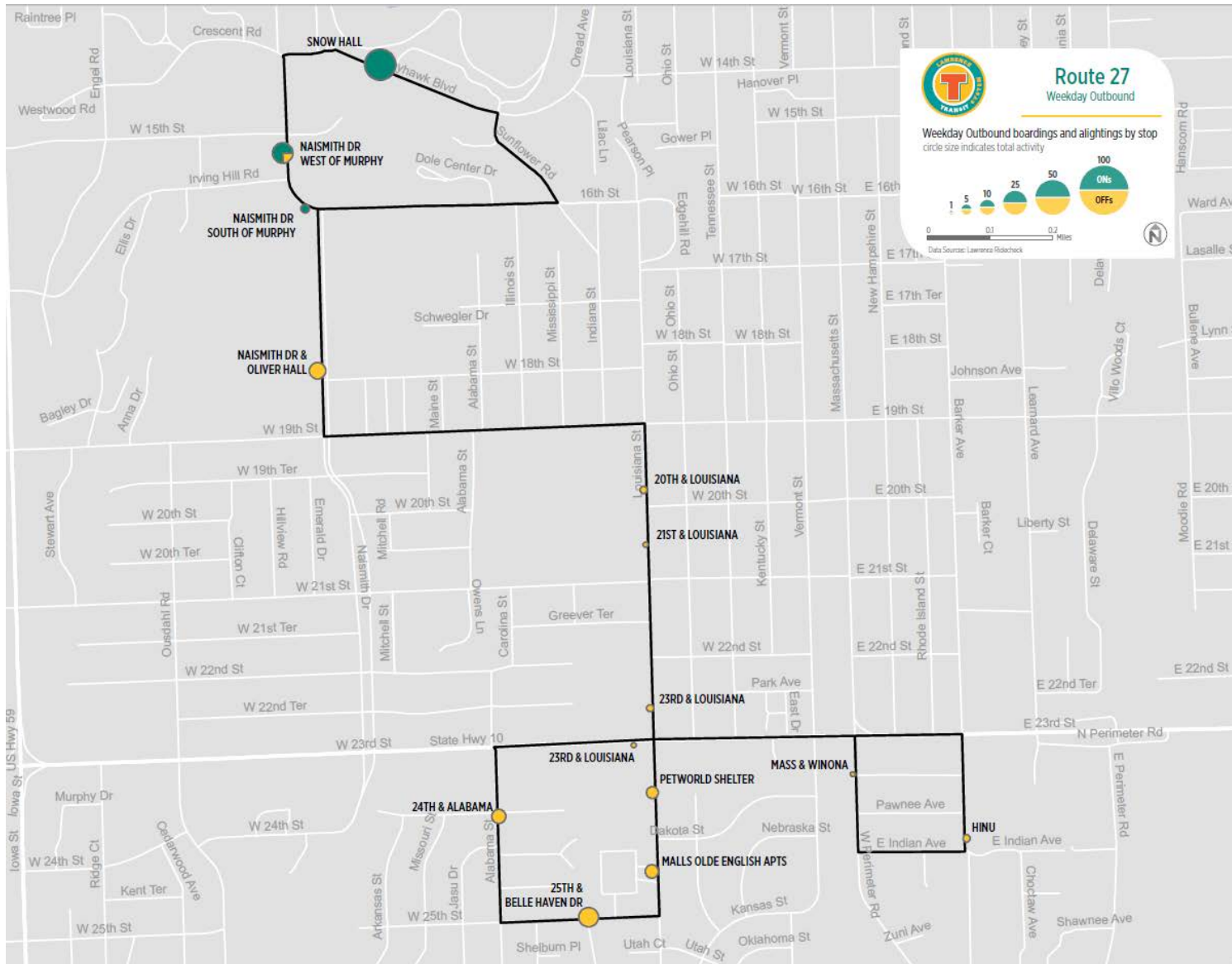
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Bailey Hall	63	Bailey Hall; KU campus
Robinson Gym	34	Robinson Gym; KU campus
19th Street / Naismith Drive	32	Naismith Hall; KU campus
Snow Hall	32	Snow Hall; KU campus
Malls Olde English Apartments	20	The Malls Shopping Center; Residential neighborhood

*Weekday inbound ridership (boardings and alightings) for Route 27 only

ROUTE EVALUATION | ROUTE 27
Lawrence Transit

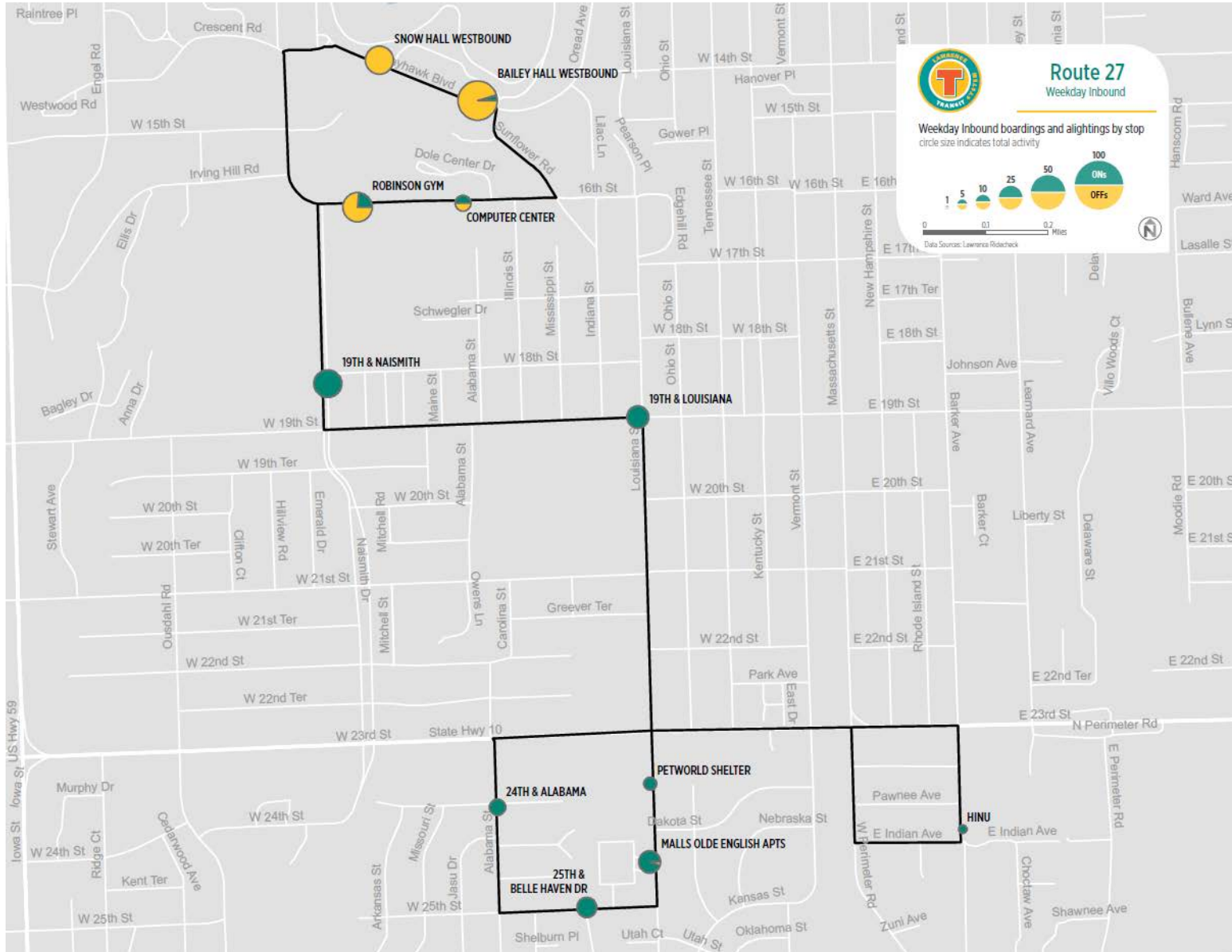
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 27
Lawrence Transit

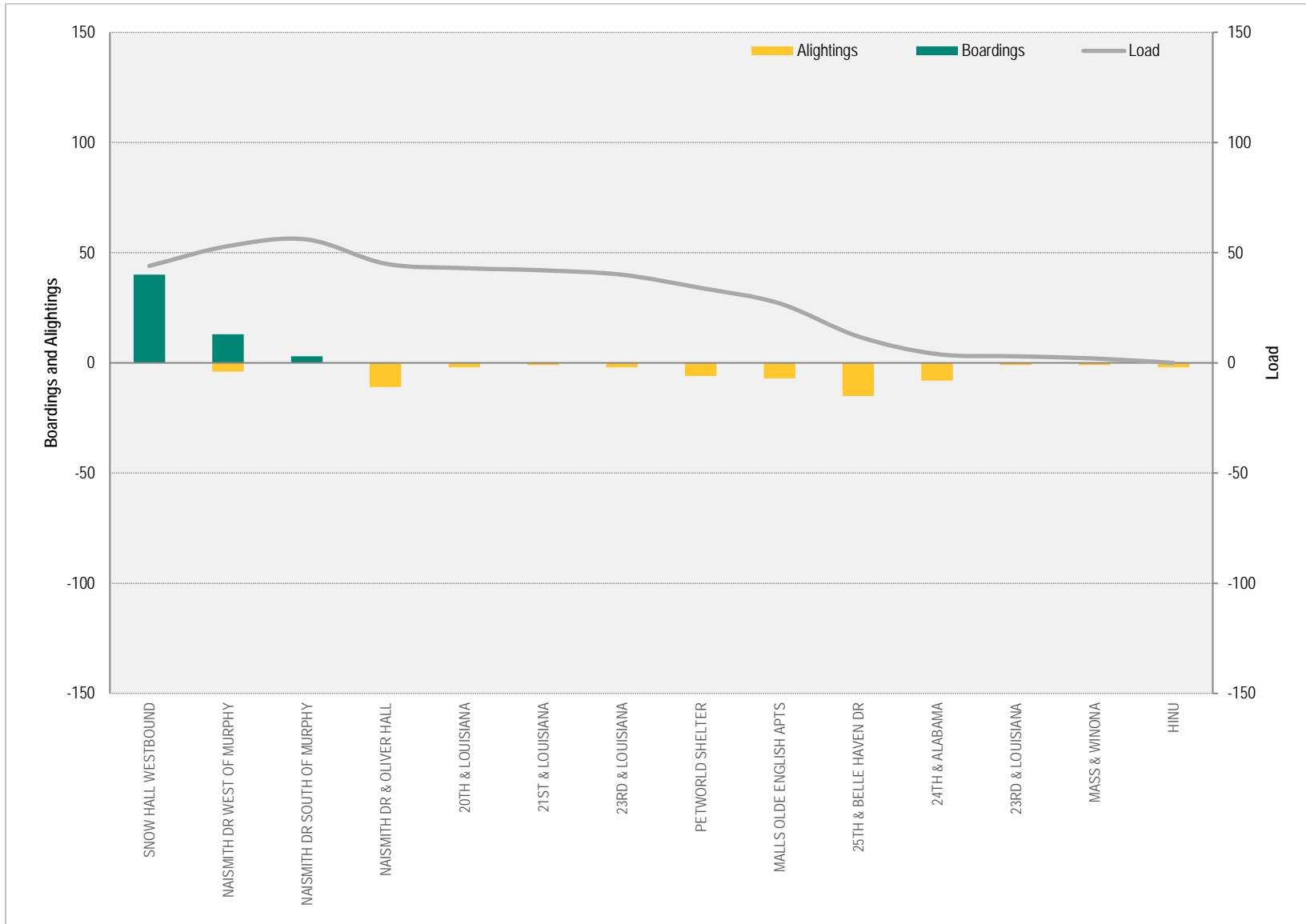
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 27
Lawrence Transit

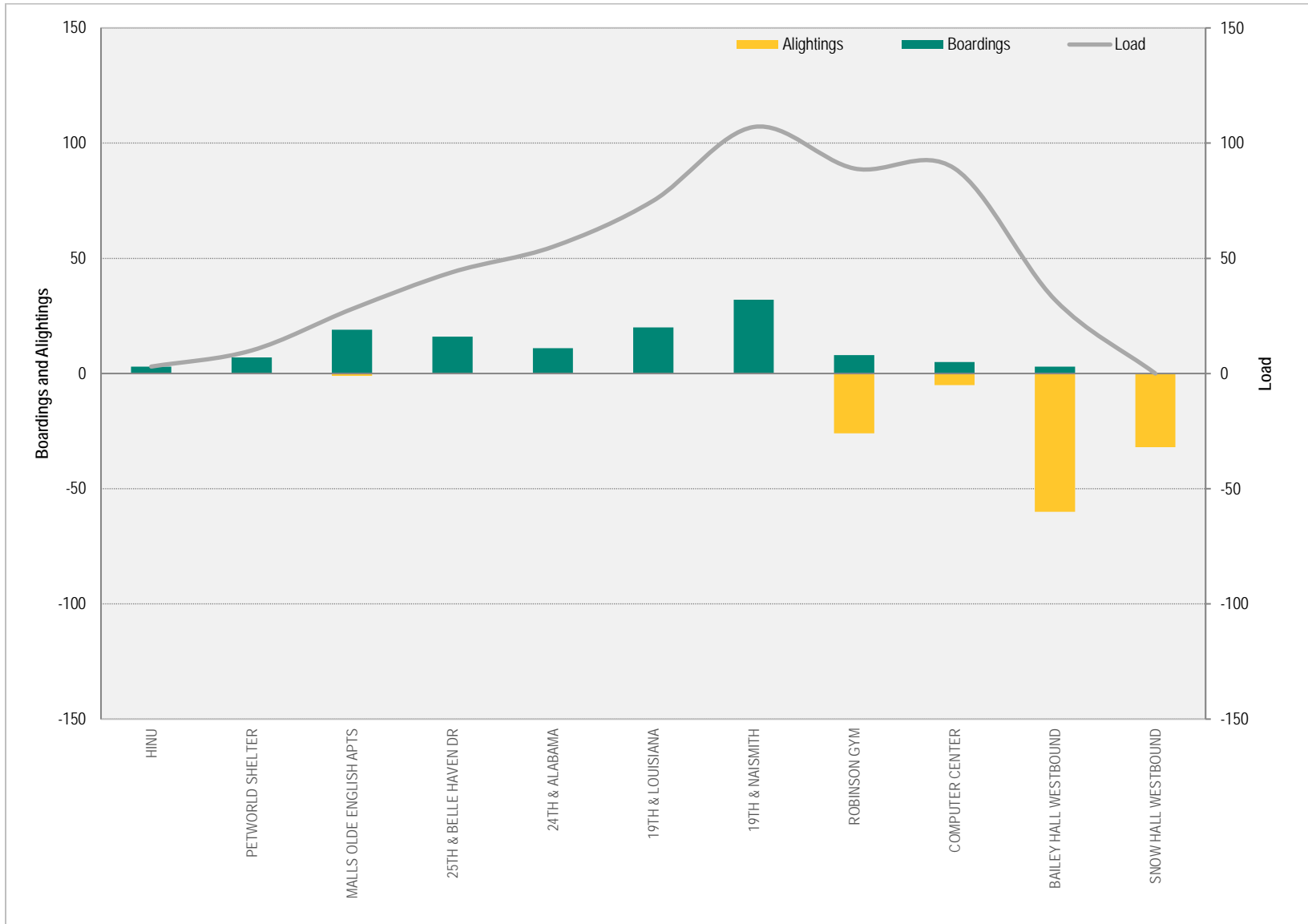
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 27
Lawrence Transit

Figure 13 | Weekday Inbound Ridership by Stop Chart

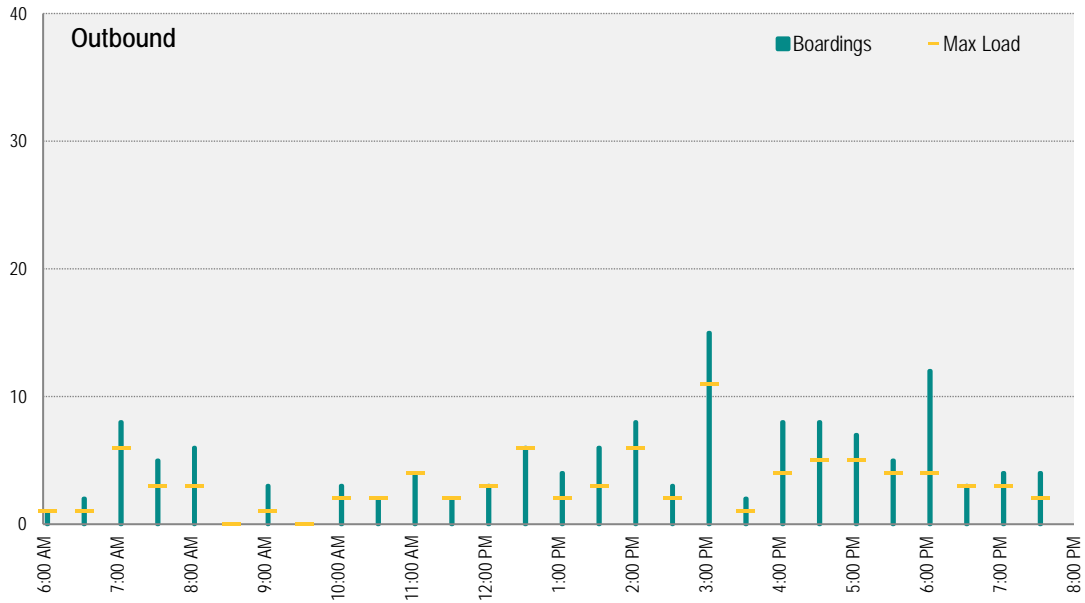


Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

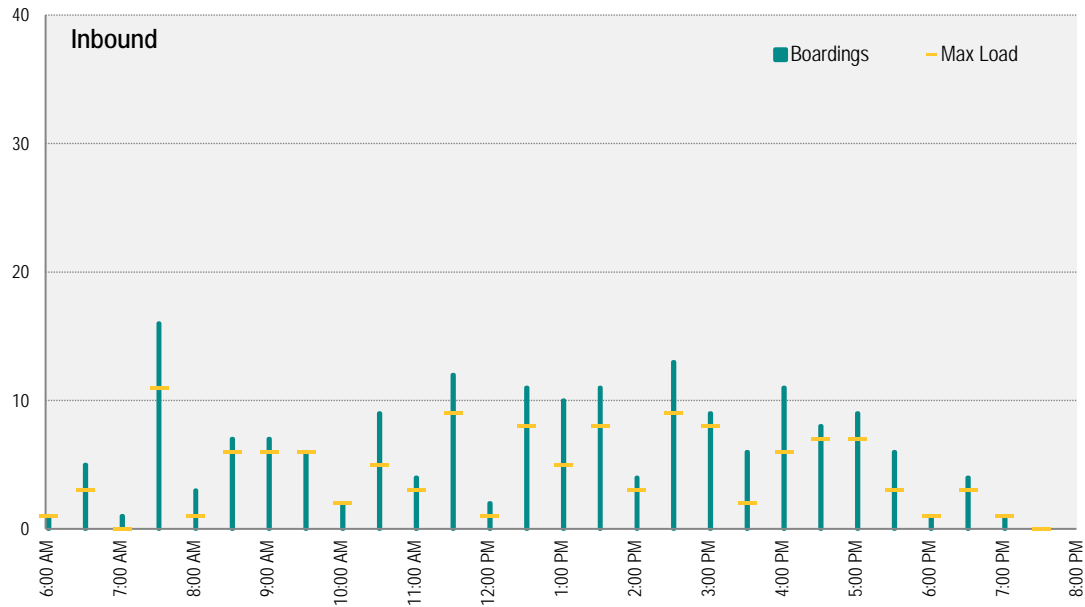
On weekdays, Route 27 ridership is highest in the outbound direction at 3:00 PM, peaking at 15 passengers per trip. Ridership is more consistent traveling in the inbound direction: ridership peaks at 7:30 AM but is moderately high from 1:30 to 6:00 PM. Seven inbound trips carry 10 or more passengers, while only two outbound trips exceed 10 passengers (Figure 14 and Figure 15).

Figure 14 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 15 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016; Max load factors include passengers that remained onboard from previous trips.
Note: No data was collected for the 11:45 AM inbound trip. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

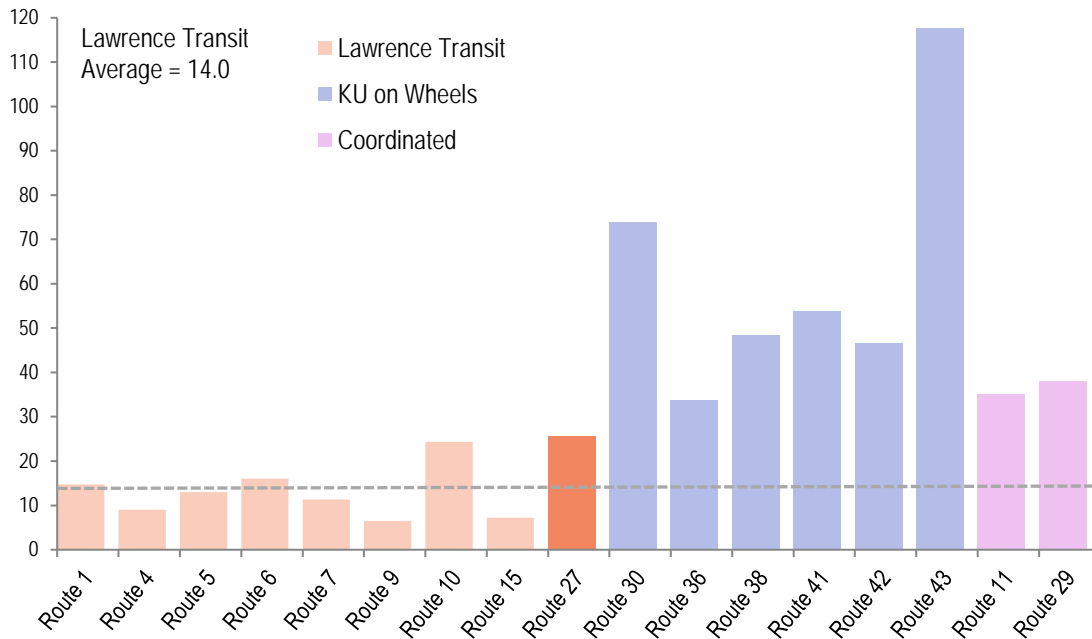
In terms of average passengers per hour, Route 27 is the most productive Lawrence Transit bus route (Figure 16). The route carries 25.5 passengers per hour on weekdays, exceeding the system average by 82% (Figure 17). Route 27 does not operate on Saturdays (Figure 18).

Figure 16 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	LAWRENCE TRANSIT AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	289	11.3	25.5	14.0	1 of 9
Saturday	--	--	--	--	--

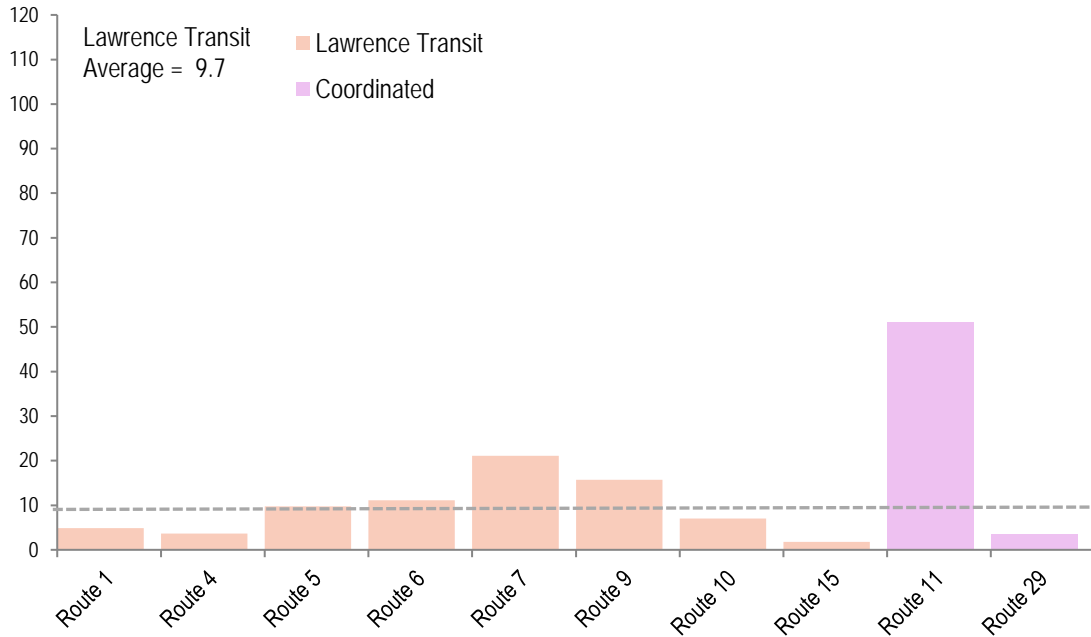
Source: Lawrence Transit, 2016

Figure 17 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 18 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 62% of Route 27 time points were served “on-time” during the survey period (Figure 19). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by both early and late departures, with 18% of time points served early and 20% served late.

Figure 19 | On-Time Performance

WEEKDAY	
On-Time	61.9%
Early	18.1%
Late	20.0%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 27 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Remove Service from Haskell Indian Nations University (HINU).** Ridership at HINU is very low in both directions on Route 27, indicating that a direct connection between KU and HINU is not in high demand. Transit service to HINU is important to maintain, but it is likely best served by some other route or in some other way. Removing service from HINU would likely create a cycle time under 30 minutes, potentially allowing for improved frequency on Route 27 while still operating the route with one vehicle.
- **Add Saturday Service on Route 27.** Ridership is strong during the weekday on Route 27, indicating that additional weekend service could also be successful. As a very fast trip between the KU campus and housing and shopping areas to the south, Saturday service would benefit students, especially in inclement weather and during exam times.
- **Improve Frequency on Weekdays.** Service every 40 minutes is not frequent enough to attract users who have other transportation options, and creates a schedule that is difficult to remember or determine the next departure without a written timetable. Lawrence Transit has had a goal of improving most routes in the system to a frequency of 30 minutes or less. As a route with strong ridership, Route 27 would benefit from an increase in frequency, making service easier to use and potentially attracting new users.
- **Interline Route 27 with Another Route.** Since Route 27 is a short route, it could interline well with another route if additional length and time is needed to create a regular cycle time. If one route has insufficient running time, and another has running time to spare, operationally linking the routes together can optimize running time and recovery time on both routes. To interline two routes, they must have a common terminus and justify similar levels of service.

Coordinated Routes

ROUTE 11

Downtown to KU to 31st and Iowa

SERVICE DESIGN

Route 11 is a route coordinated between Lawrence Transit and KU on Wheels that operates between the Downtown Transit Hub, the University of Kansas, and Pine Ridge Plaza. The route travels primarily along Iowa Street, Naismith Drive, 19th Street, Irving Hill Road, Jayhawk Boulevard, 11th Street, and Indiana Street (Figure 1). Route 11 provides service to numerous social services in downtown Lawrence, retail destinations, and KU destinations, including academic buildings, residence halls, and recreation facilities.

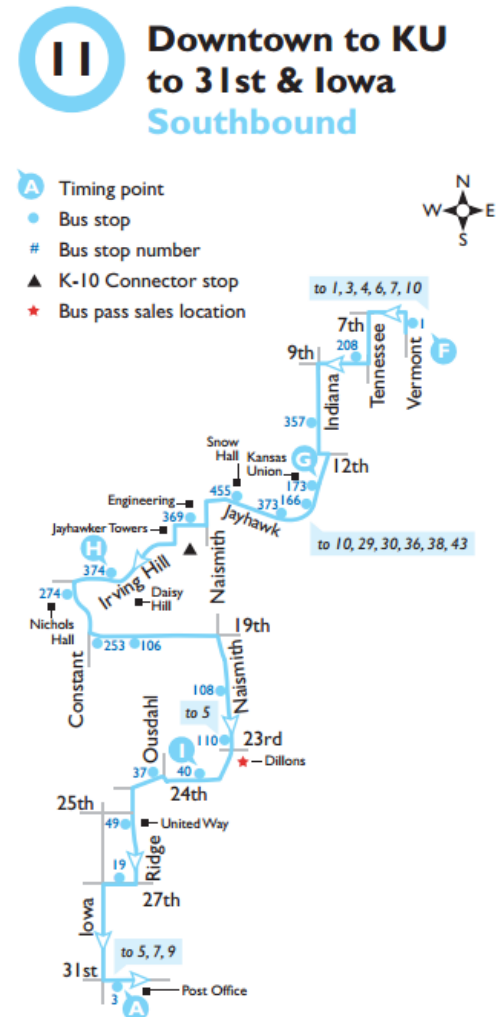
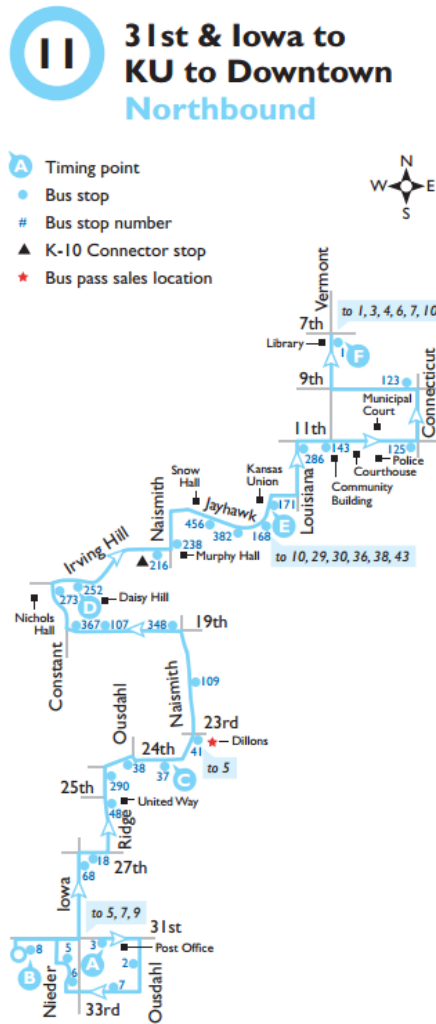
ALIGNMENT/SERVICE PATTERNS

Route 11 features a separate alignment for outbound (south) and inbound (north) service, but maintains a single consistent weekday service pattern. Departing outbound from the Downtown Transit Hub Route 11 turns left on 7th Street, left on Tennessee Street, right on 9th Street, left on Indiana Street, left on 12th Street, and right on Jayhawk Boulevard. From Jayhawk Boulevard Route 11 travels around the traffic circle onto Crescent Road, turns left on Naismith Drive, right on 15th Street, left on Burdick Road, and right on Irving Hill Road. Route 11 follows Irving Hill Road, turns left on Constant Avenue, left on 19th Street, right on Naismith Drive, right on 24th Street, and follows 24th Street through Ousdahl Road to Ridge Court. Route 11 then turns left on Ridge Court, right on 27th Street, left on Iowa Street, and left on 31st Street, before terminating at Pine Ridge Plaza.

Returning inbound, Route 11 departs Pine Ridge Plaza on 31st Street, turns right on Ousdahl Road, right on 33rd Street, right on Nieder Road, left on 31st Street, and turns left to serve The Reserve apartment complex off 31st Street. From The Reserve, Route 11 turns right on 31st Street, left on Iowa Street, right on 27th Street, left on Ridge Court, and right on 24th Street. The route follows 24th Street through Ousdahl Road, turns left on Naismith Drive, left on 19th Street, right on Constant Avenue, right on Irving Hill Road, left on Naismith Drive, and right onto Jayhawk Boulevard. From Jayhawk Boulevard Route 11 turns right on 13th Street, left on Louisiana Street, right on 11th Street, left on Connecticut, left on 9th Street, and right on Vermont Street, terminating at the Downtown Transit Hub.

ROUTE EVALUATION | ROUTE 11
Coordinated Route

Figure 1 | Route Map



Source: Lawrence Transit; August 2015 – September 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 11 and several Lawrence Transit routes at the Downtown Transit Hub and Pine Ridge Plaza, and to multiple KU on Wheels routes at the Kansas Union. There are also transfer opportunities at several other points along the route, including along Iowa Street (Route 5, Route 7, Route 9); transfers to the K-10 Connector, operated by Johnson County Transit, are available on Irving Hill Road (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Downtown Transit Hub	Route 1, Route 3, Route 4, Route 6, Route 7, Route 10, Route 15
Kansas Union	Route 10, Route 29, Route 30, Route 36, Route 38, Route 43
Pine Ridge Plaza	Route 5, Route 7, Route 9
Snow Hall	Route 10, Route 27, Route 29, Route 30, Route 36, Route 38, Route 41, Route 42, Route 43

SERVICE SCHEDULE

Route 11 operates service Monday-Saturday year round (Figure 3). On weekdays the route runs every 30 minutes from 6:03 AM to 8:03 PM. On Saturdays the route operates every 30 to 60 minutes from 6:31 AM to 7:52 PM. Route 11 does not operate on Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	6:03 AM – 8:03 PM	30	27/28
Saturday	6:31 AM – 7:52 PM	30-60	24/23
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 11 ranks first of two coordinated routes in terms of weekday ridership and in terms of ridership per trip (Figure 4). On average, the route carries 1,469 passengers, or 22.3 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 11 features the highest ridership among all systems in Lawrence, carrying 716 passengers, or 15.2 passengers per trip.

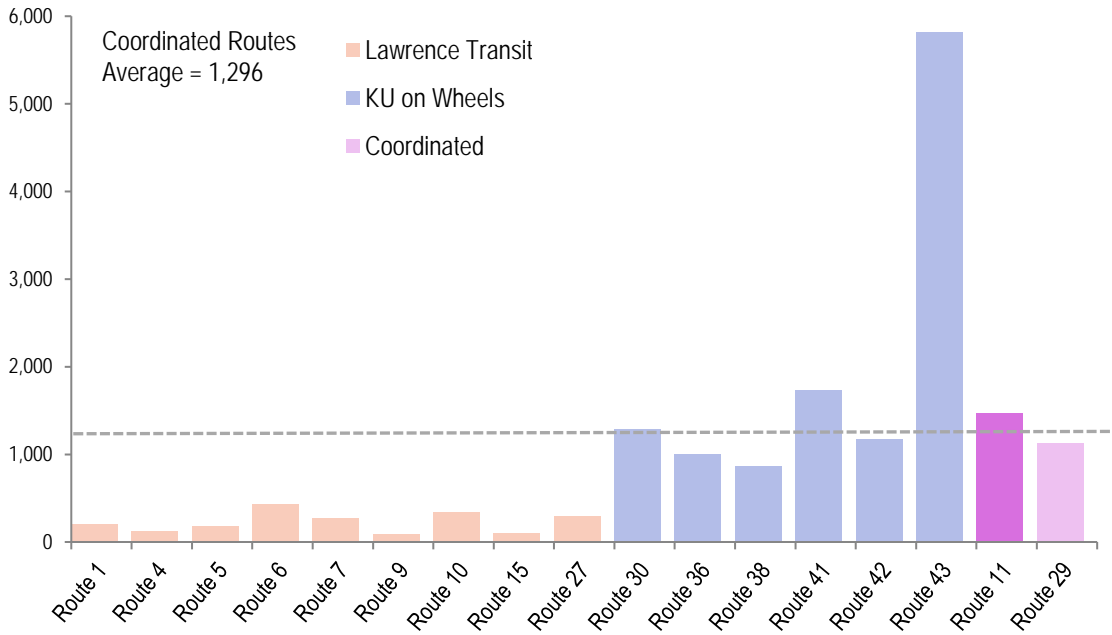
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	COORDINATED AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	1,469	55	22.3	19.9	1 of 2
Saturday	716	47	15.2	9.7	1 of 2

Source: Lawrence Transit, 2016

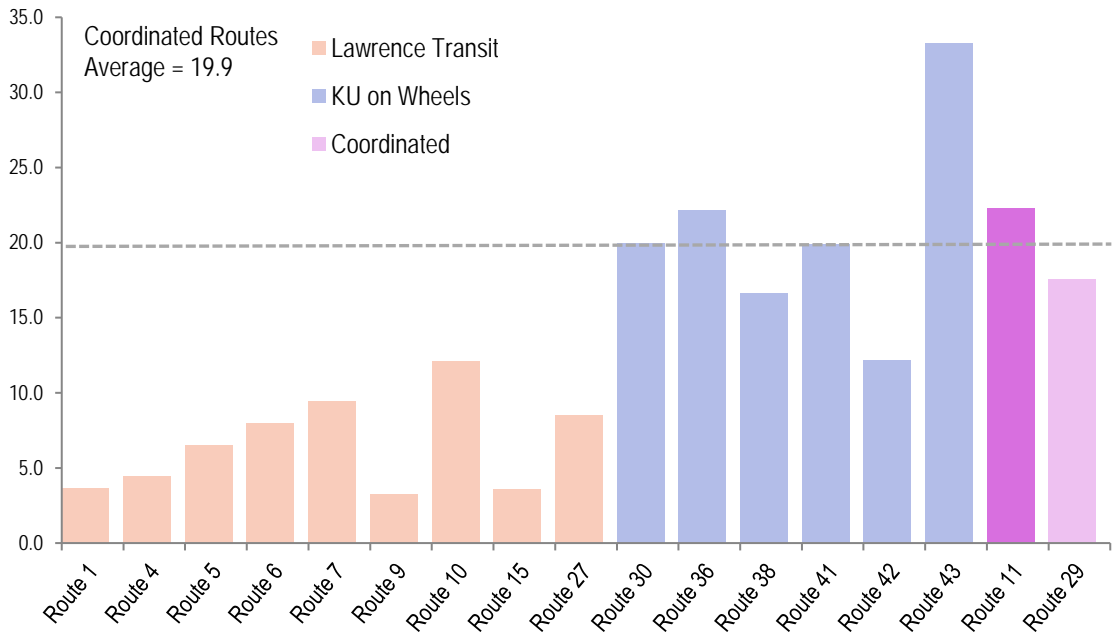
ROUTE EVALUATION | ROUTE 11
Coordinated Route

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

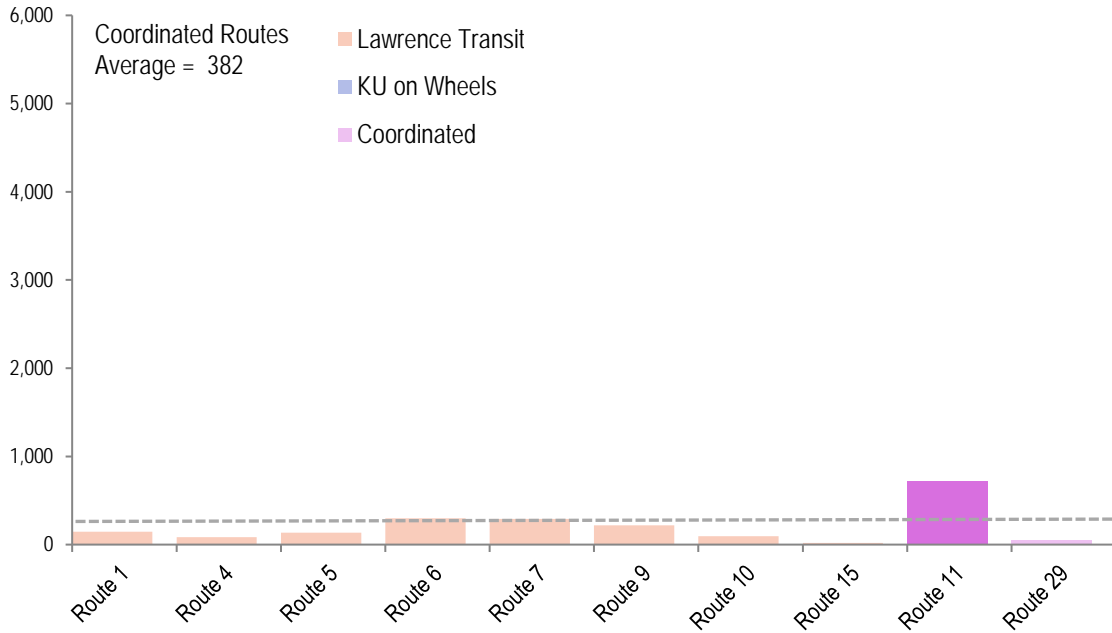
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

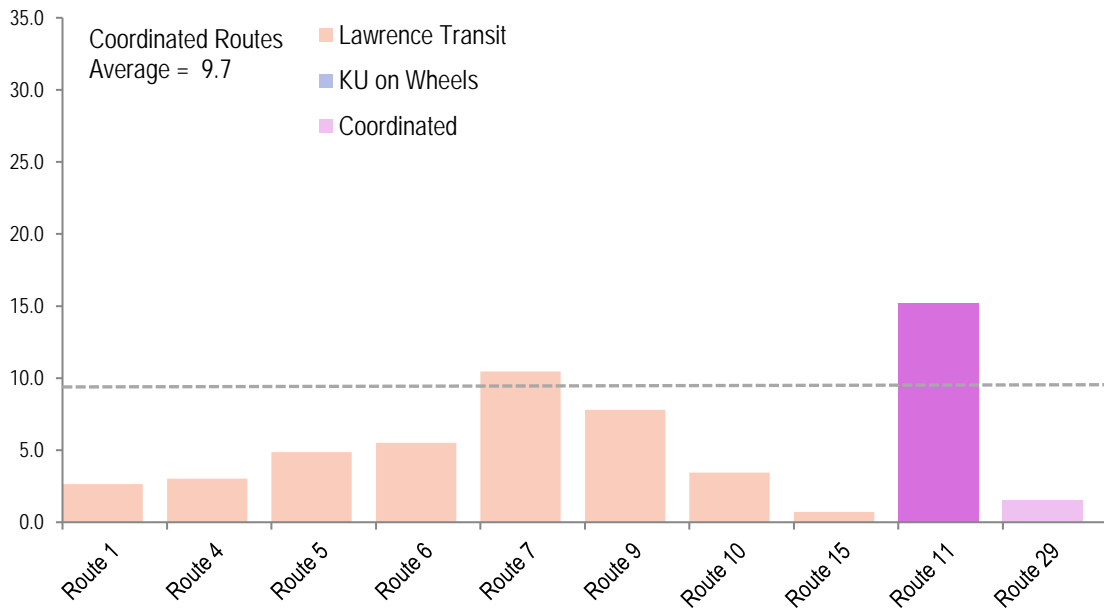
ROUTE EVALUATION | ROUTE 11
Coordinated Route

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 11 traveling inbound are located on KU’s campus and near major residential complexes along 31st Street (Figure 9). Inbound weekday ridership peaks at the stop at Jayhawk Boulevard and Budig Hall, serving an average of 227 daily passengers. Other stops generating more than 100 combined boardings and alightings per weekday include: West 31st Street and The Reserve, Kansas Union, Irving Hill Road and Engel Road, and 31st Street and Ousdahl Drive. These stops serve central locations on KU’s campus, including numerous academic buildings and the Lied Center of Kansas, as well as serving off-campus student housing complexes such as The Reserve and The Connection at Lawrence. All other stops serve fewer than 88 boardings and alightings (Figure 10-Figure 13).

Traveling in the outbound direction, the highest weekday ridership is concentrated at stops on KU’s campus: Snow Hall (201 passengers), Kansas Union (156 passengers), and Bailey Hall Westbound (148 passengers).

Saturday ridership patterns on Route 11 are similar to weekday, but with lower activity; no stops serve more than 100 daily passengers (Figure 14-Figure 17). However, Route 11 records consistent activity on Saturday at retail and student housing locations. The most active inbound Saturday stop is at 33rd Street and Kohl’s, generating 97 combined boardings and alightings. The stop at Irving Hill Road and Engel Road generates 73 passengers, and 50 passengers utilize the stop at Kansas Union. No other stops record more than 42 daily passengers.

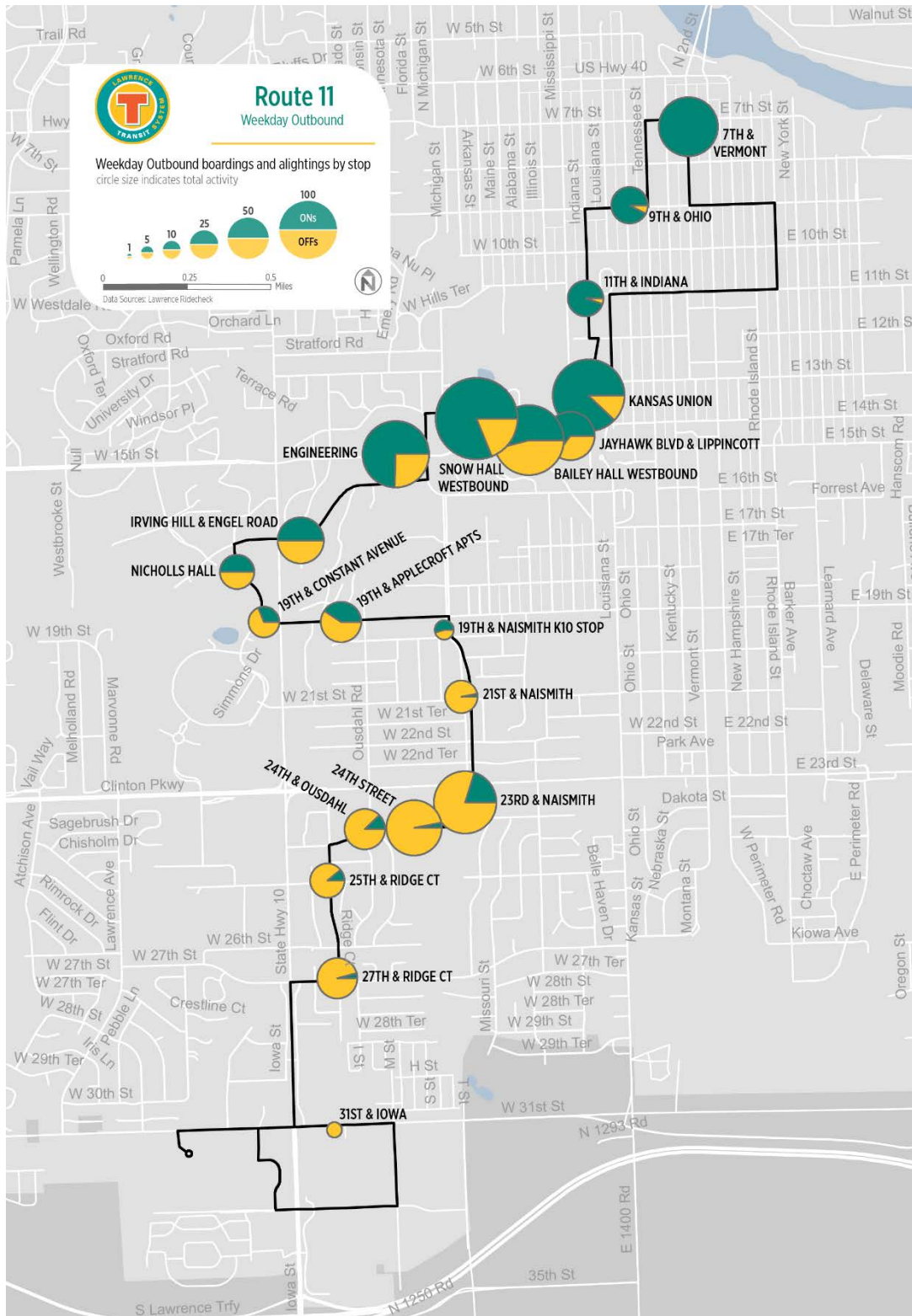
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Jayhawk Boulevard / Budig Hall	227	Budig Hall, KU campus
West 31st Street / The Reserve	202	The Reserve; off-campus student housing
Kansas Union	136	Kansas Union; KU campus
Irving Hill Road / Engel Road	132	Oswald Hall; on-campus student housing; Lied Center of Kansas
31st Street / Ousdahl Drive	105	The Connection at Lawrence; off-campus student housing; Pine Ridge Plaza

*Weekday Inbound ridership (boardings and alightings) for Route 11 only

ROUTE EVALUATION | ROUTE 11
Coordinated Route

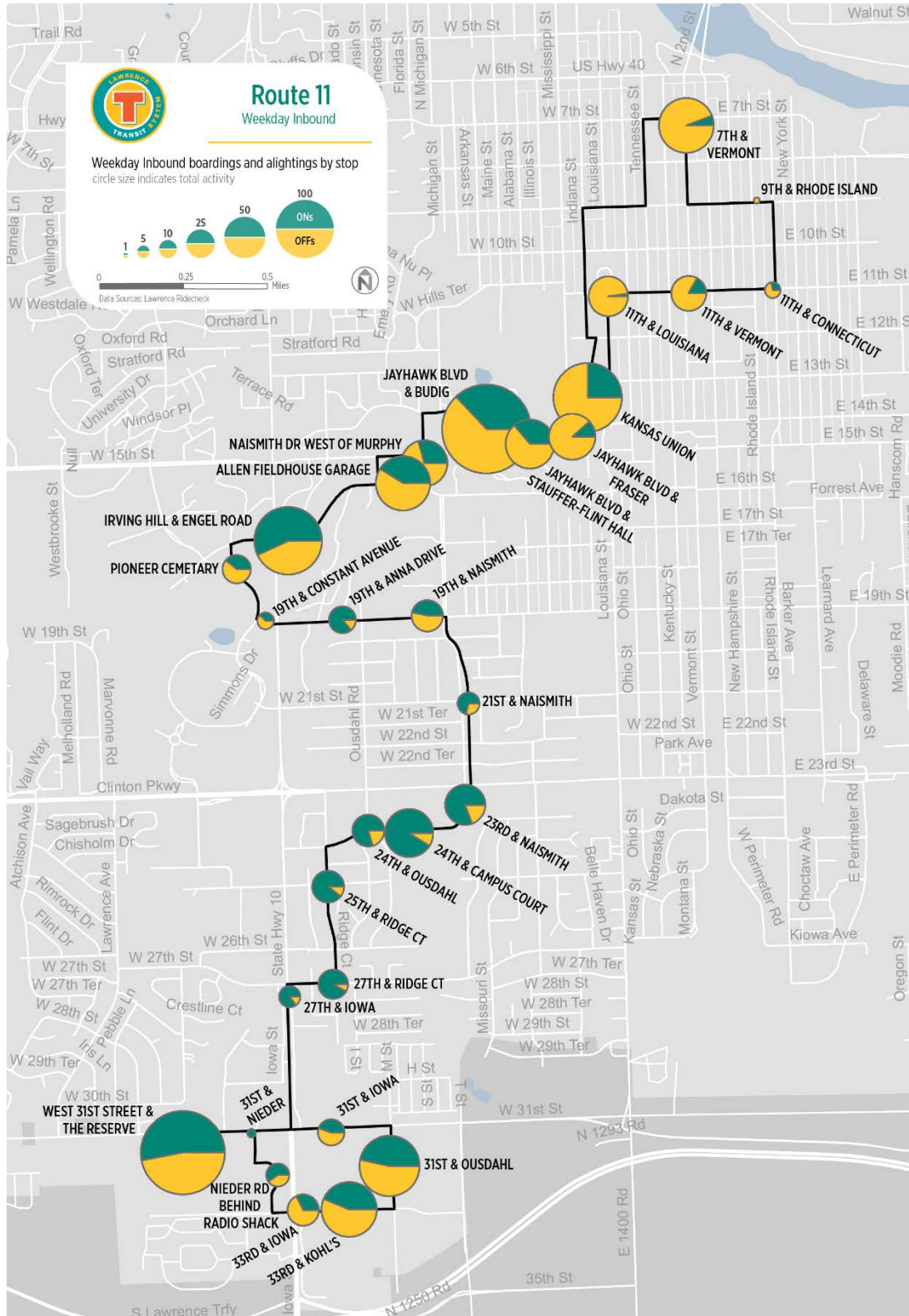
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

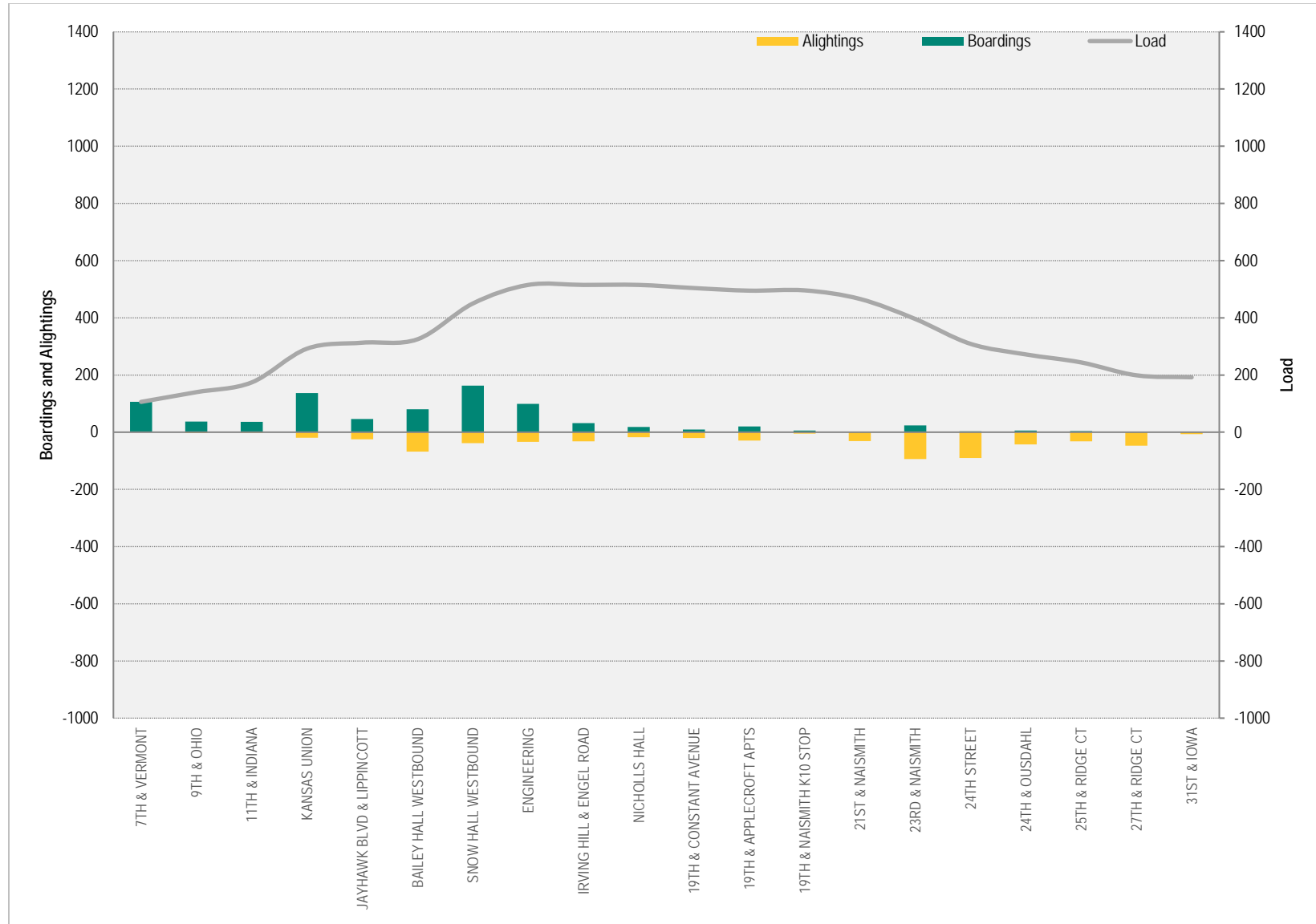
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

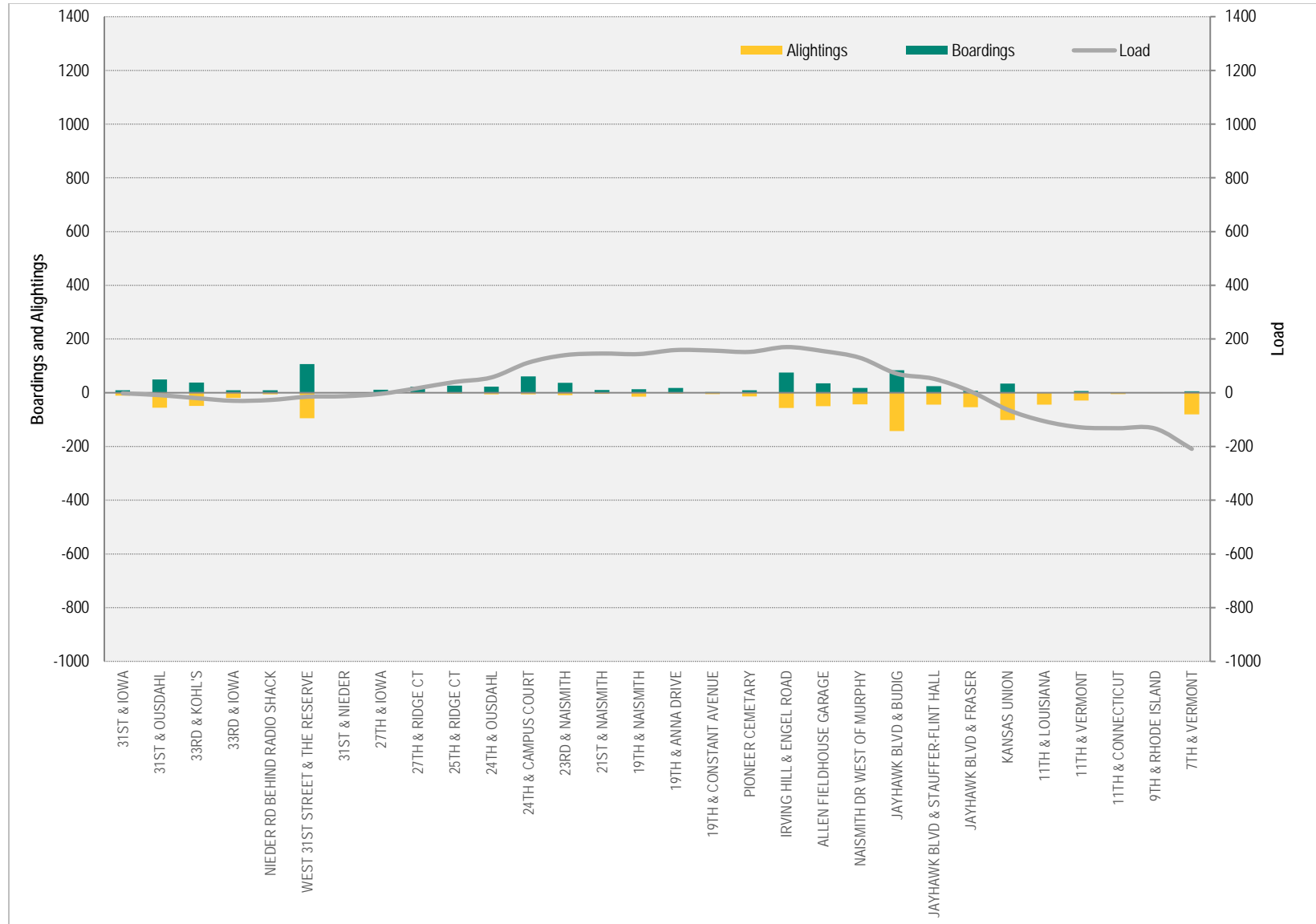
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

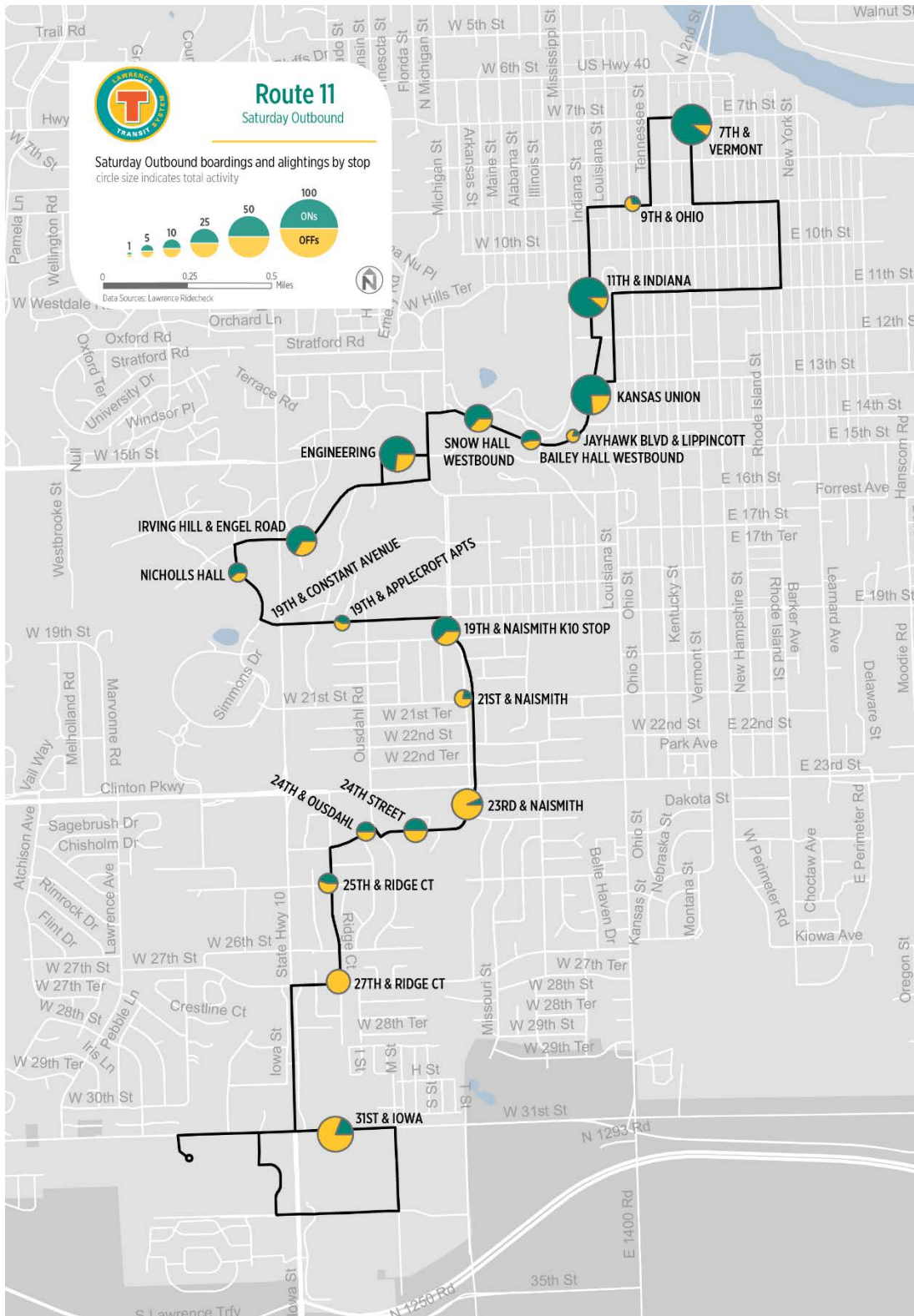
Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

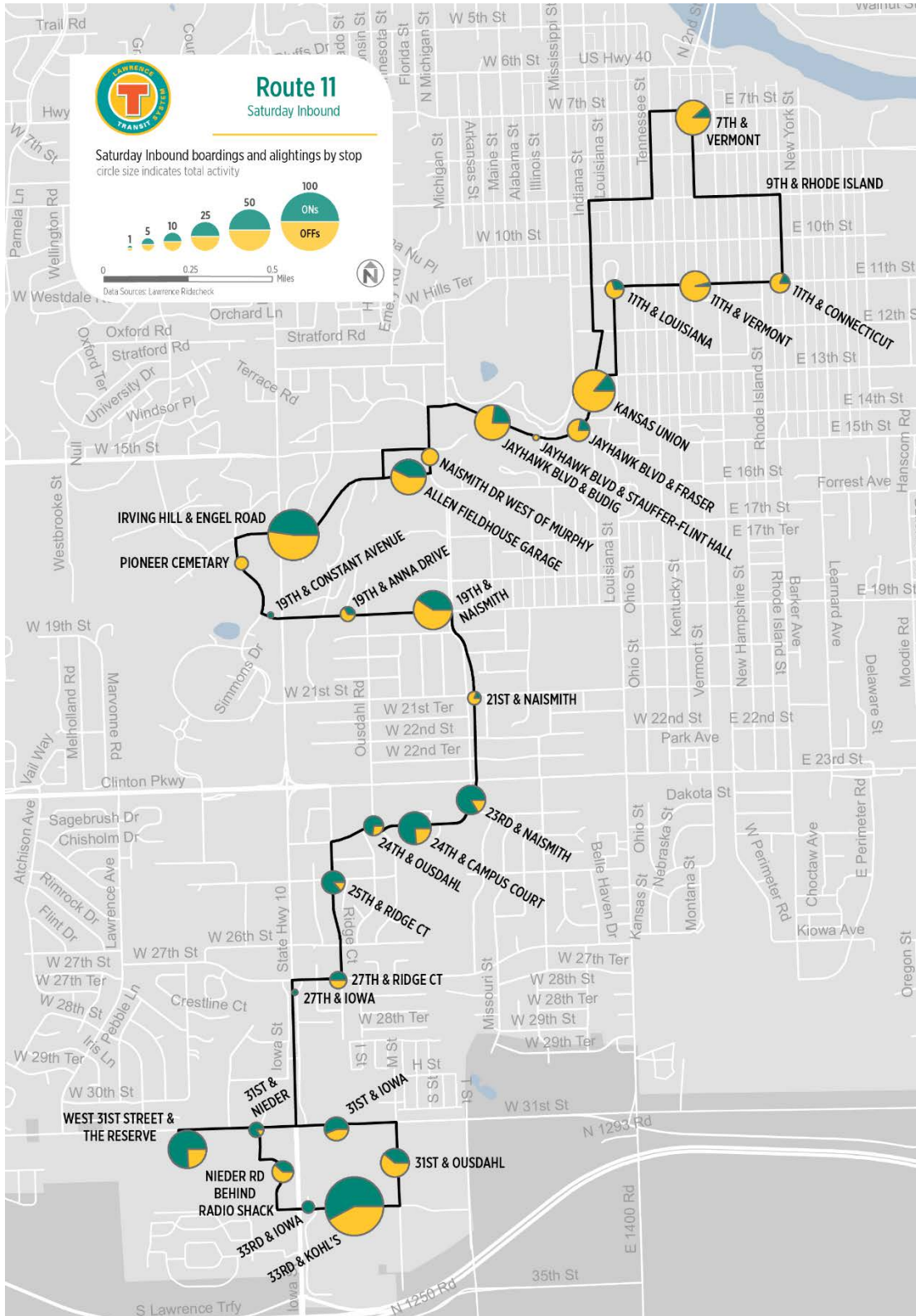
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

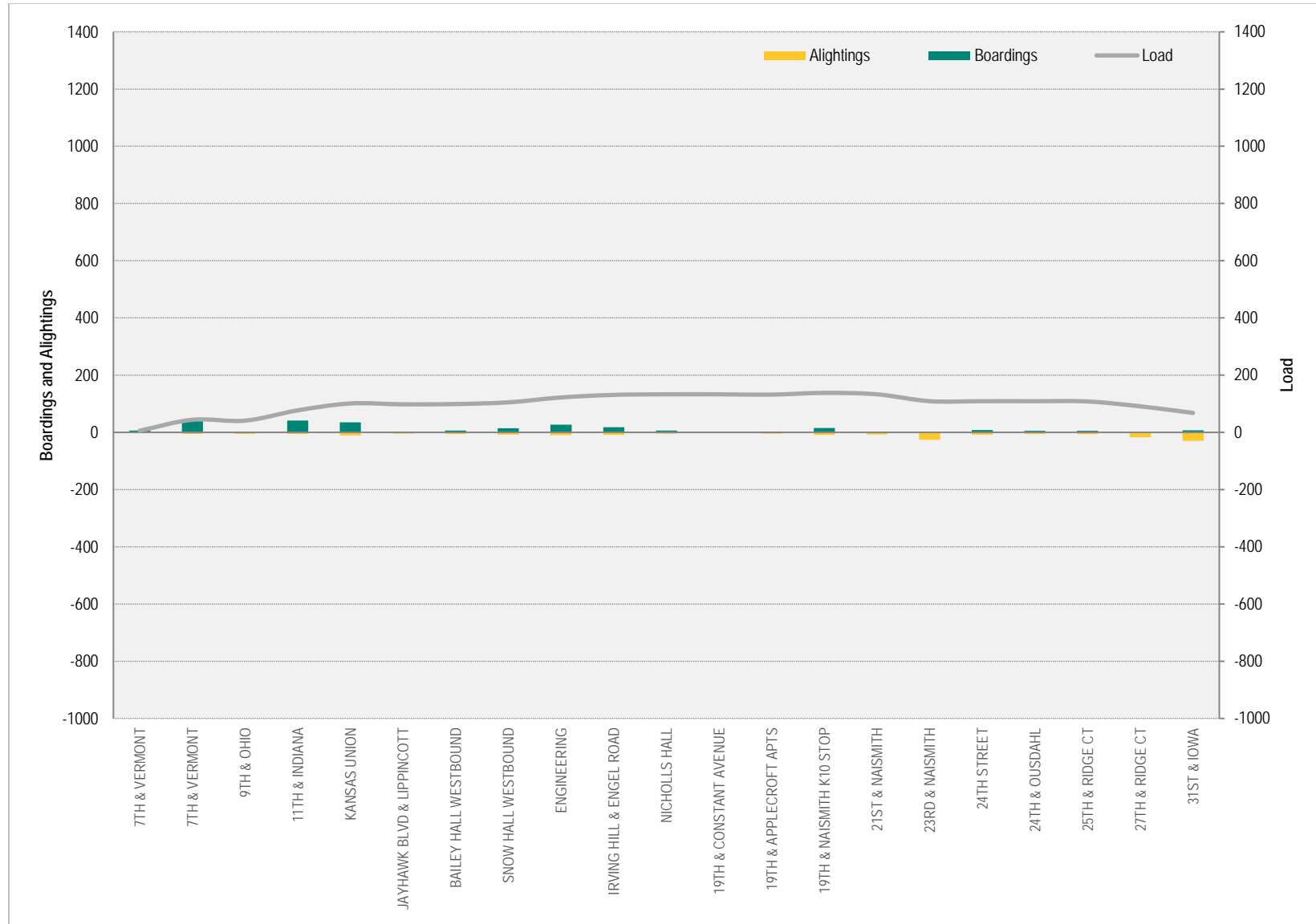
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

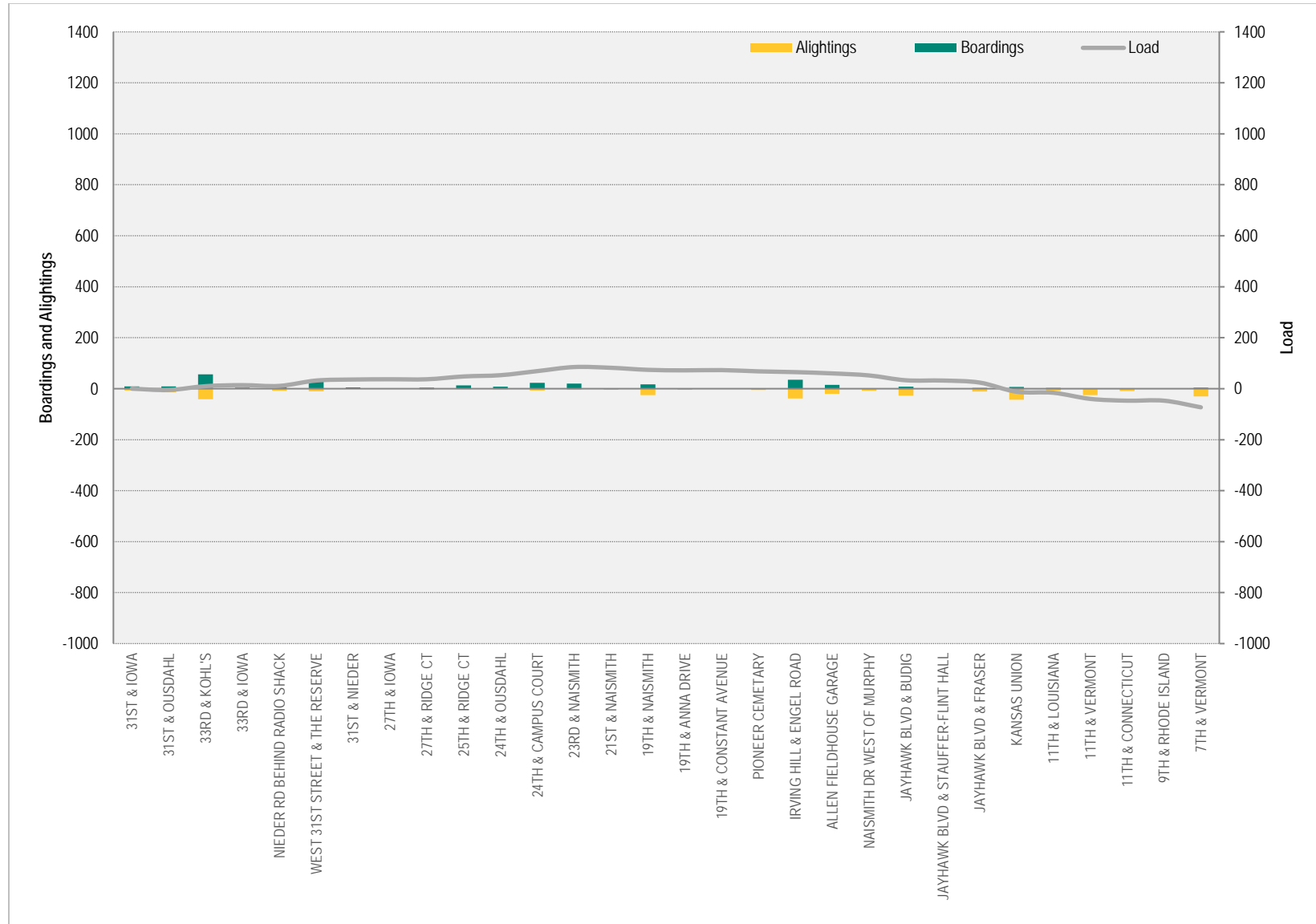
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 11
Coordinated Route

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

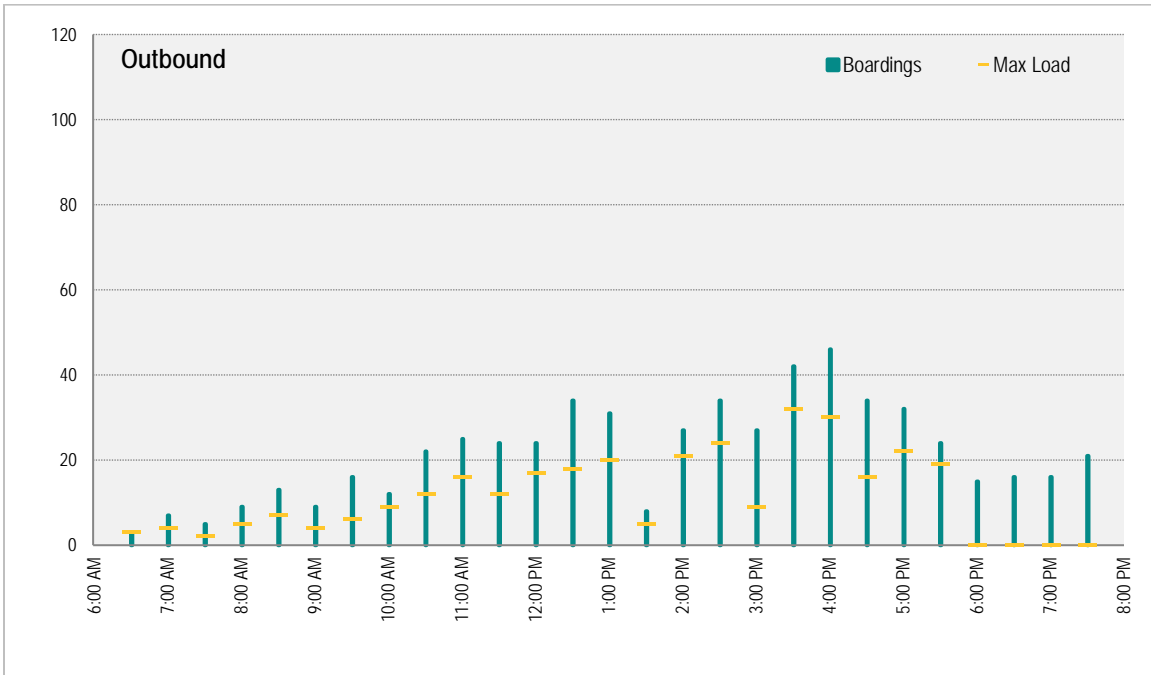
Route 11 is well-utilized on weekdays, featuring above-average ridership per trip (Figure 18 and Figure 19). On weekdays, Route 11 ridership is consistently high from the mid-morning period through the remainder of service. Overall, 55% of trips carry more than 20 passengers and 26% of trips carry more than 30 passengers. After 10:30 AM only one trip carries fewer than 15 passengers (at 1:30 PM). Traveling inbound, ridership peaks at 1:33 PM, at 56 passengers. Moreover, the majority of inbound trips (89%) carry 10 or more passengers; 54% inbound trips carry 20 passengers or more.

Several weekday maximum loads approach the total seating capacity (35-40 passengers), but no loads exceed capacity on a single trip. This indicates there's a steady turnover of passengers over the course of the route, which limits the need for passengers to stand.

On Saturdays, Route 11 ridership is highest in the outbound direction during the early evening service period (4:00 – 6:30 PM), when two trips carry more than 30 passengers (Figure 20 and Figure 21). Overall, seven outbound trips carry 20 passengers or more. After 12:00 PM only two trips carry fewer than 10 passengers (1:31 PM and 3:01 PM). Saturday inbound ridership is relatively static throughout the service period, peaking in the afternoon and evening hours at 22 passengers. Overall, 83% of inbound Saturday trips carry 10 passengers or more

ROUTE EVALUATION | ROUTE 11
Coordinated Route

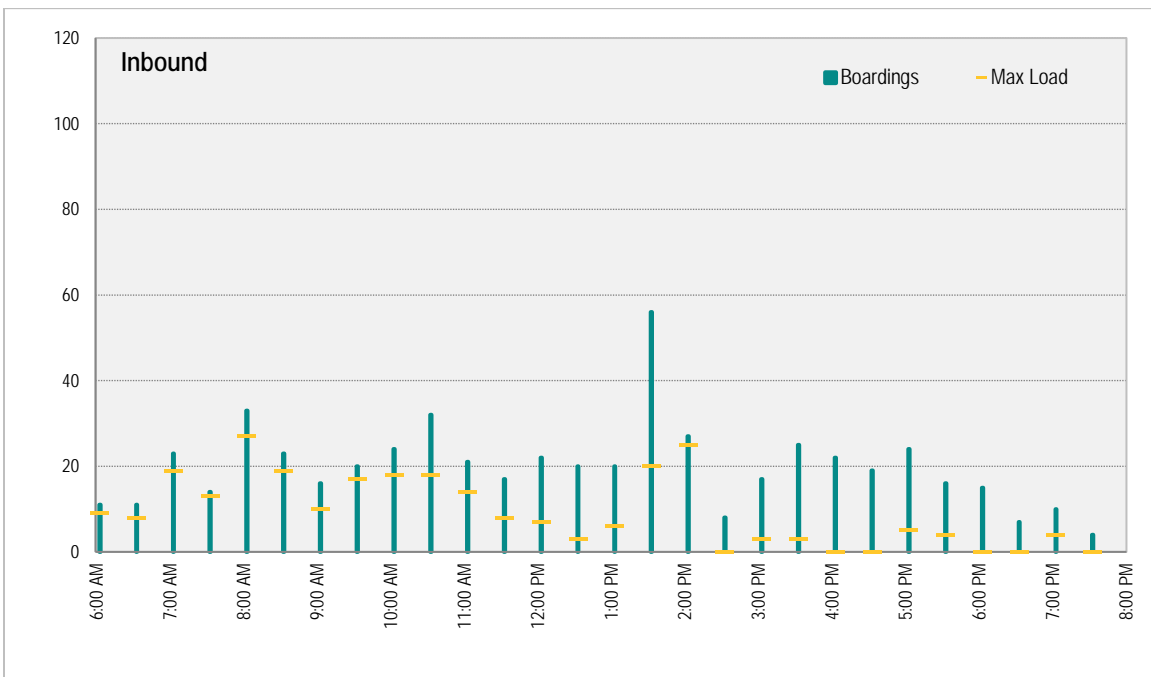
Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 19 | Weekday Inbound Ridership by Trip Chart

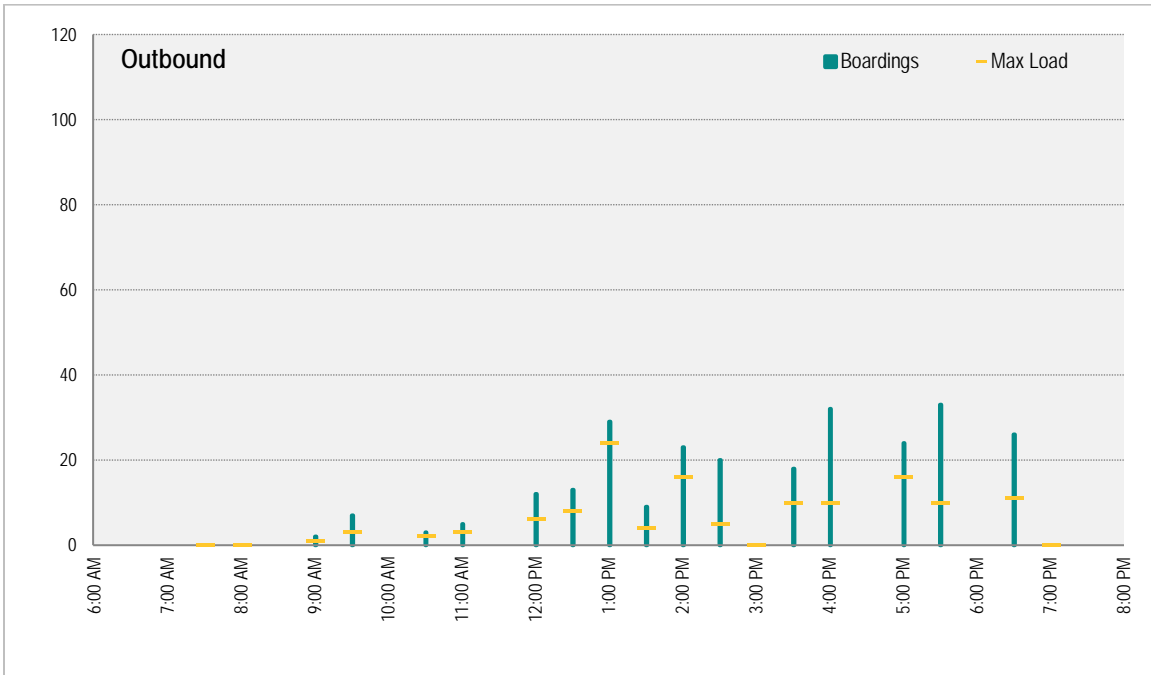


Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

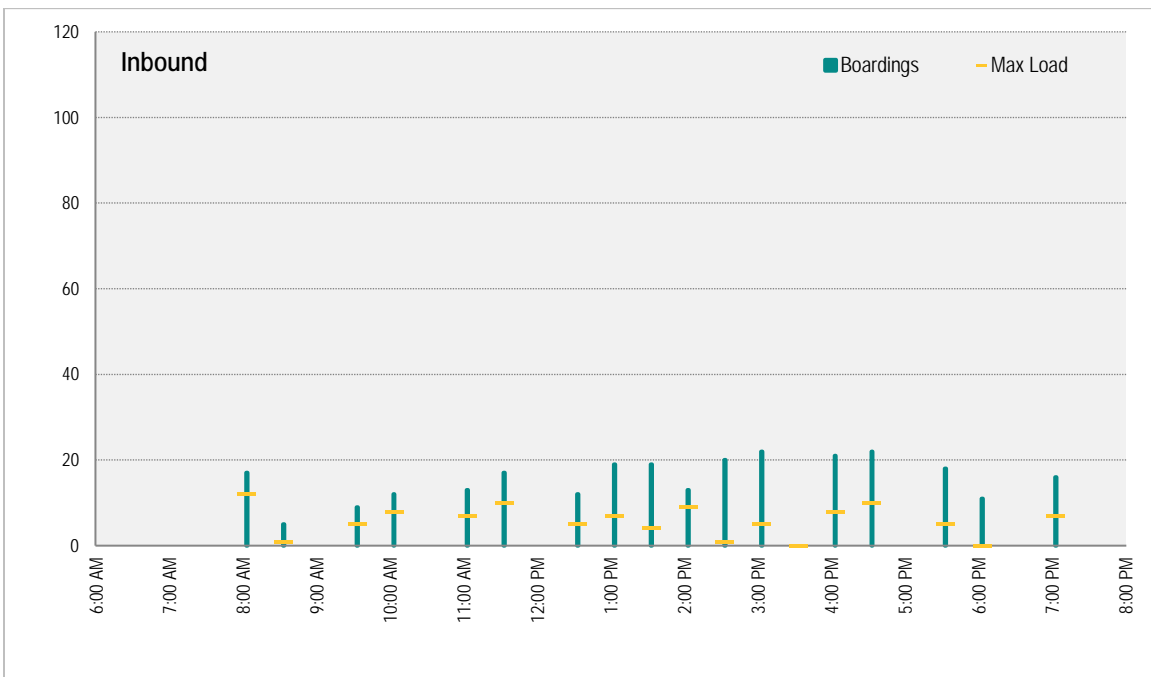
ROUTE EVALUATION | ROUTE 11
Coordinated Route

Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 6:31 AM, 7:01 AM, 8:31 AM, 10:01 AM, and 11:31 AM outbound trips
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 7:03 AM, 7:33 AM, 9:03 AM, 10:33 AM, and 12:03 PM inbound trips.
Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

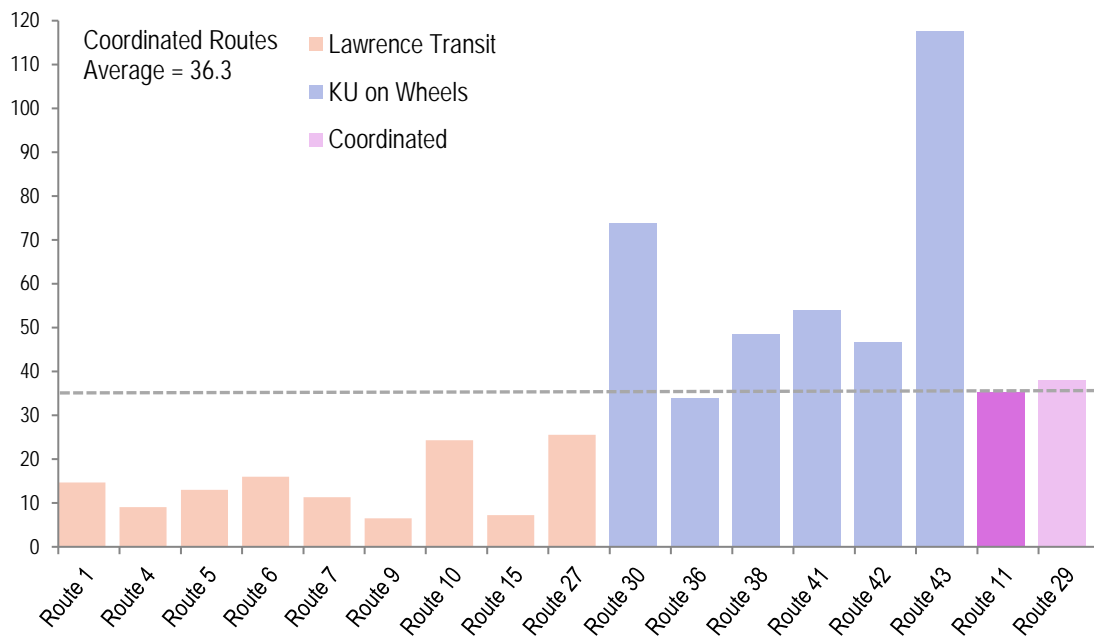
In terms of average passengers per hour, Route 11 is the second most productive coordinated route (Figure 22). The route carries 35.1 passengers per hour on weekdays, 3% less than the system average (Figure 23). Route 11 carries 23.5 passengers per hour on Saturdays, 28% more than the system average (Figure 24).

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	COORDINATED ROUTES AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	1,469	41.8	35.1	36.3	2 of 2
Saturday	716	30.4	23.5	18.4	1 of 2

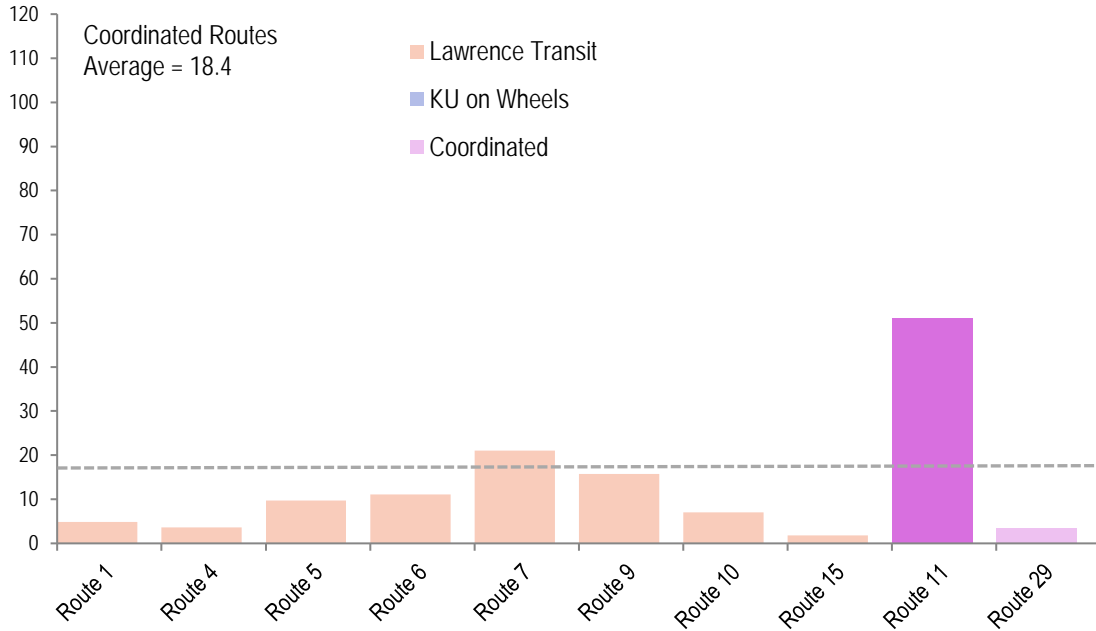
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 51.8% of Route 11 time points were served “on-time” during the survey period (Figure 25). On Saturdays, approximately 54.5% of Route 11 time points were served “on-time” during the survey period.” Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by primarily by late departures (28.5%), but early departures were also recorded at nearly 20% of all time points. Saturday on-time performance was the inverse of the weekday, with early departures occurring at 32.4% of time points, and 13.1% of time points impacted by late departures.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	51.8%	54.5%
Early	19.7%	32.4%
Late	28.5%	13.1%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 11 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Increase Frequency to Every 20 Minutes During Peak Periods.** Route 11 has strong ridership throughout the day and experiences overcrowding issues in the southbound/outbound direction during the afternoon. Increasing the frequency to every 20 minutes would help alleviate some of those issues.
- **Operate Along Naismith Drive.** As Route 11 heads outbound, it heads southwest from downtown to KU and continues southwest as it serves numerous student housing complexes. However, it then turns back east to service Naismith Drive and back west to neighborhoods south of W. 23rd Street before reaching the retail area at W. 31st Street and Iowa Street. It is also a fairly long route, taking over 30 minutes to travel between the retail area and downtown. To speed up and strengthen the route, consider moving Route 11 to Naismith Drive between W. 19th Street and Sunnyside Avenue. This would provide more direct service between retail, off-campus housing, Jayhawk Boulevard, and downtown. While service to W. 19th Street, Constant Avenue, and Irving Hill Road would be removed, those areas are still well-connected to the existing system to make quick transfers, or minor tweaks to other routes can more effectively serve these areas. In addition, this may help with overcrowding because students must then take Route 43 to reach Irving Hill Road and other student housing on Daisy Hill and West Campus.
- **Improve Functionality of Downtown Alignment.** The current alignment in downtown differs in the inbound and outbound directions to help provide east-west coverage in downtown. This can be beneficial if the alignments are relatively close and people can walk between the inbound and outbound stops quickly. However, the Route 11 alignment is far apart and may be diluting the effectiveness of the service since riders are not able to return to their starting point if they travel in both directions during the day. Operating an outbound and inbound alignment that provide coverage, but that are easy to walk between, will simplify and improve the service. This will also likely improve the discrepancy in travel time between the outbound and inbound alignment, excluding the retail area loop and service to The Reserve on the northbound alignment. Currently, Route 11 takes about 25 minutes to reach W. 24th Street and Naismith Drive from downtown in the southbound direction, while it takes about 30 minutes in the northbound direction.
- **Extend Service to 9:00 PM.** Route 11 has a wide variety of land uses that it serves, enabling riders to make many different connections and attracting ridership. Thus the community may appreciate later service on the route to reach jobs, shop, visit campus or downtown, and be able to make a return trip after dinner time by transit. Extending service by about an hour or an hour and half would allow for many of these trips to occur.

Coordinated Routes

ROUTE 29

27th & Wakarusa to KU

SERVICE DESIGN

Route 29 is a route coordinated between Lawrence Transit and KU on Wheels that operates the Kansas Union and the intersection of 24th Place and Crossgate Drive. The route travels primarily along Jayhawk Boulevard, 15th Street, Iowa Street, Clinton Parkway, Wakarusa Drive, Inverness Drive, and 24th Place (Figure 1). Route 29 connects the KU Main Campus to apartment complexes and shopping centers along Clinton Parkway in southwest Lawrence.

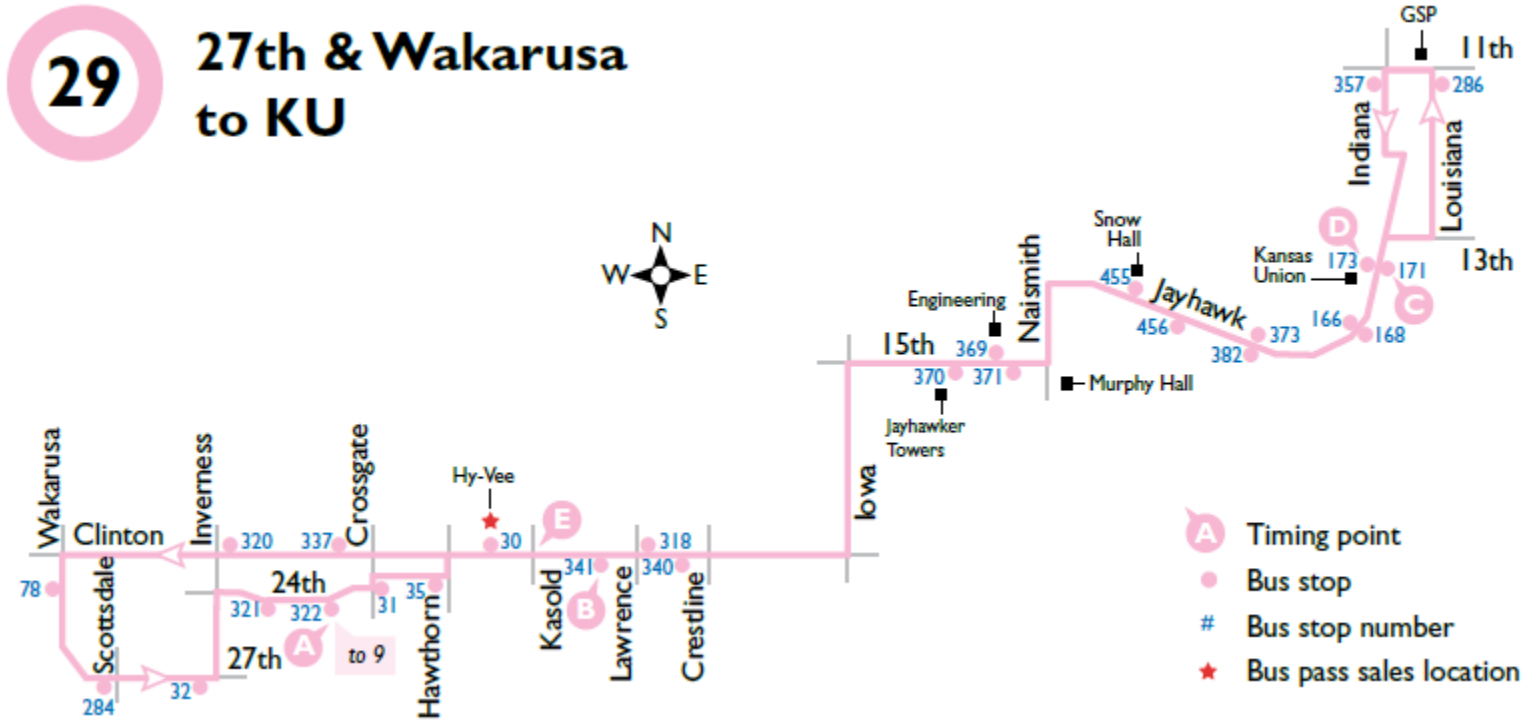
ALIGNMENT/SERVICE PATTERNS

Route 29 has a single consistent service pattern for weekday and Saturday service. Departing outbound from the Kansas Union, Route 29 travels southwest on Jayhawk Boulevard, turns left on Naismith Drive, right on 15th Street, left on Iowa Street, right on Clinton Parkway, left on Wakarusa Drive, straight onto 27th Street, left on Inverness Drive, and right on 24th Place before terminating just before the intersection with Crossgate Drive.

Returning inbound from 24th Place and Crossgate Drive, Route 29 turns left onto Crossgate Drive right on Clinton Parkway, and then continues along the outbound alignment to the Kansas Union. After serving the Kansas Union, Route 29 completes a turnaround loop by turning right on 13th Street, left on Louisiana Street, left on 11th Street, left on Indiana Street, left on 12th Street, right on Oread Avenue and then ending service at the Kansas Union.

ROUTE EVALUATION | ROUTE 29
Coordinated Route

Figure 1 | Route Map



Source: Lawrence Transit; August 2015 – August 2016
 New route alignment effective as of August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 29 and several Lawrence Transit and KU on Wheels routes at the Kansas Union. There are also transfer opportunities at several other points along the route, including along 15th Street (Route 10, Route 30, and Route 43) and 27th Street (Route 9); transfer opportunities to the K-10 Connector are also available on 15th Street (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Kansas Union	Route 10, Route 11, Route 30, Route 36, Route 38, Route 43
11th Street and Louisiana Street	Route 10, Route 11
W 24th Place	Route 9
Snow Hall	Route 10, Route 11, Route 27, Route 30, Route 36, Route 38, Route 41, Route 42, Route 43

SERVICE SCHEDULE

Route 29 operates Monday-Saturday when KU is in session (Figure 3). On weekdays, the route runs every 20 minutes from 7:00 AM to 6:32 PM. On Saturdays, Route 29 runs every 40 to 60 minutes from 7:20 AM to 6:22 PM. Route 29 does not run on Sundays, and operates on a limited schedule during KU's academic breaks and the summer session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	7:00 AM – 6:32 PM	20	32/32
Saturday	7:20 AM – 6:22 PM	40-60	16/16
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 29 ranks second of two coordinated routes in terms of weekday ridership and second of two in terms of ridership per trip (Figure 4). On average, the route carries 1,123 passengers, or 17.5 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). On Saturdays, Route 29 carries 49 passengers, or 1.5 passengers per trip (Figure 7 and Figure 8).

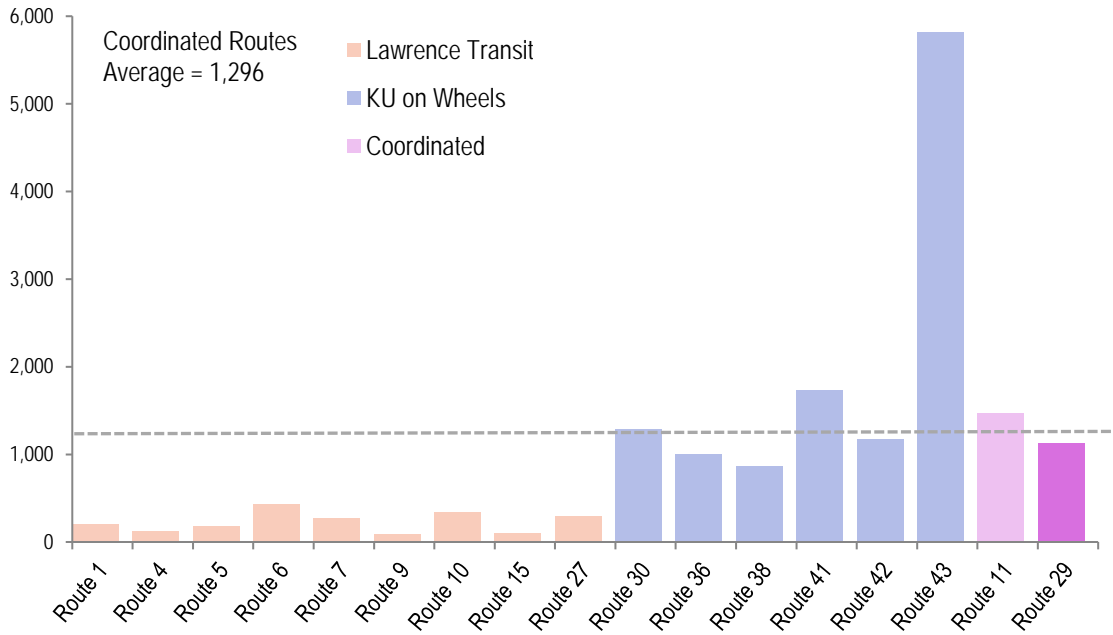
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	COORDINATED ROUTES AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	1,123	66	17.5	19.9	2 of 2
Saturday	49	32	1.5	9.7	2 of 2

Source: Lawrence Transit, 2016

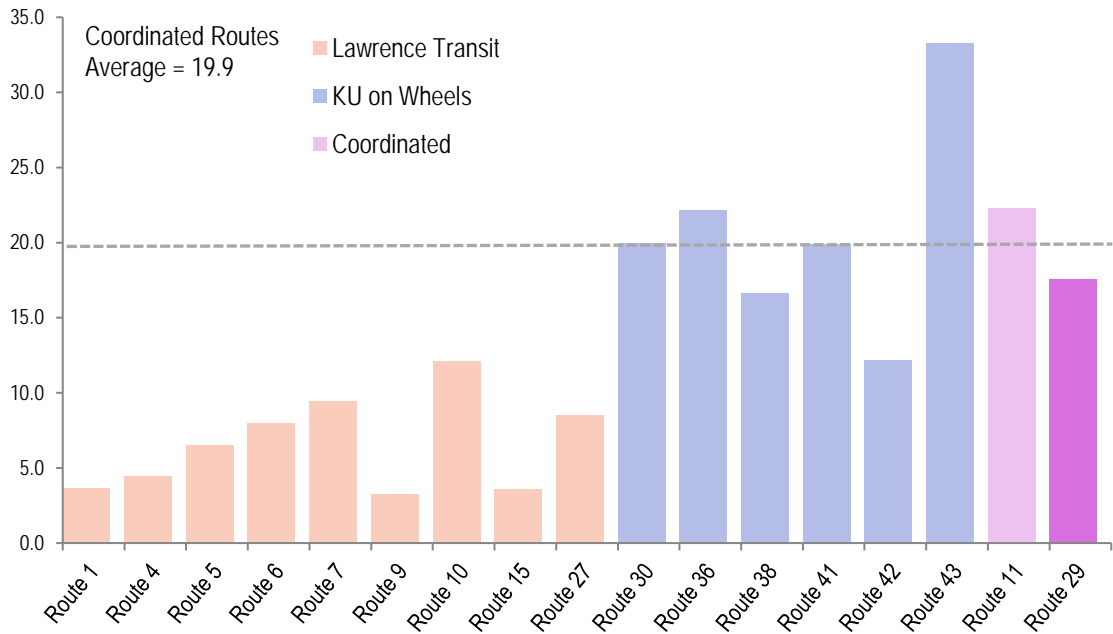
ROUTE EVALUATION | ROUTE 29
Coordinated Route

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

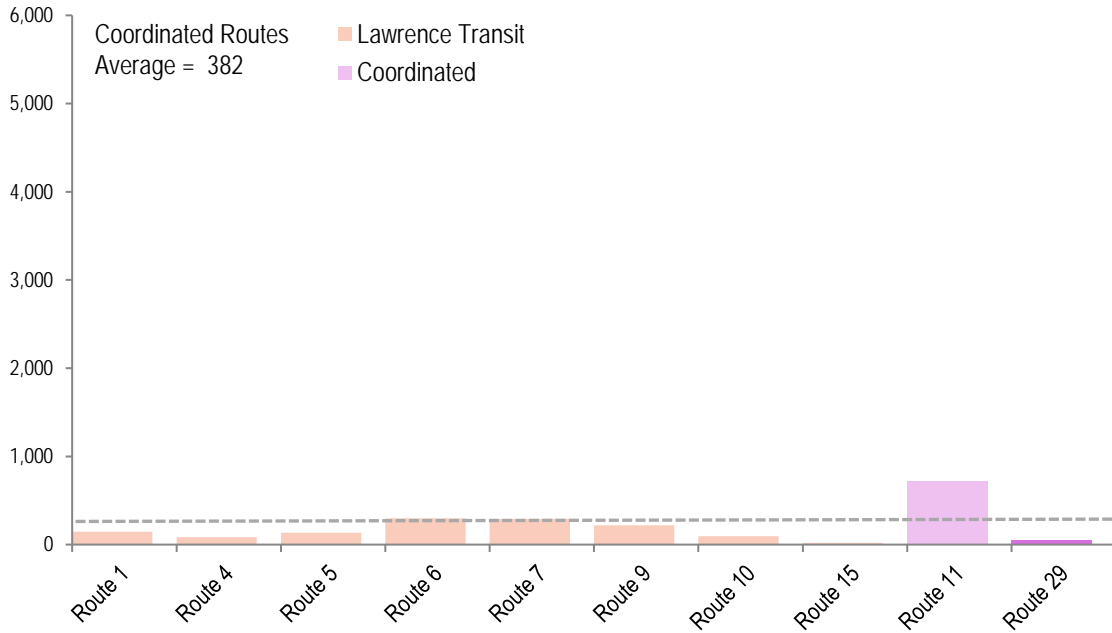
Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

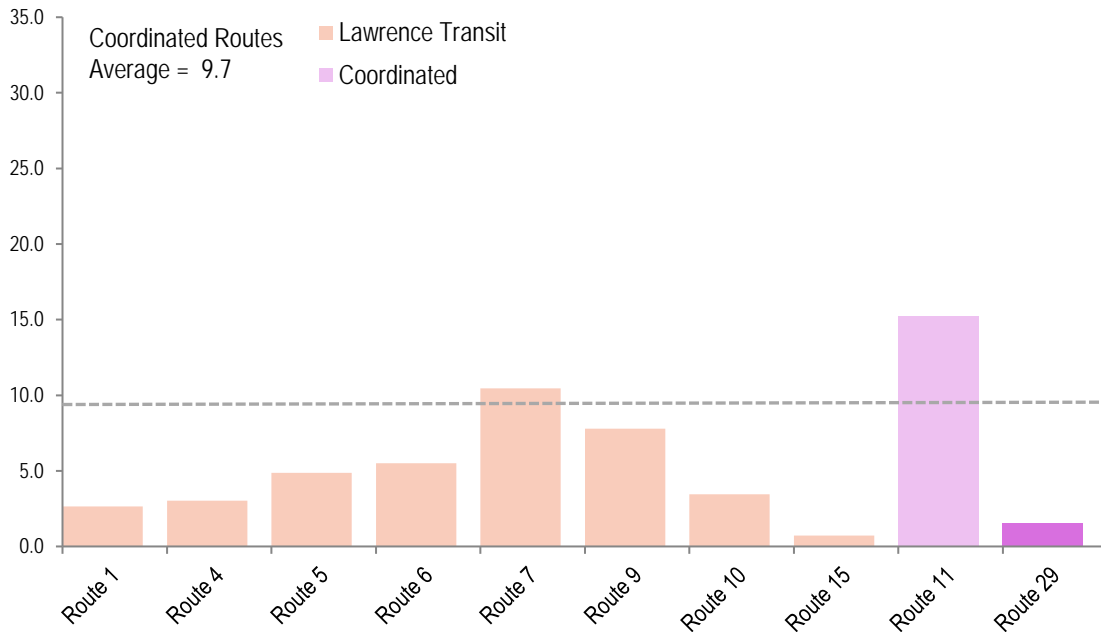
ROUTE EVALUATION | ROUTE 29
Coordinated Route

Figure 7 | Saturday Ridership by Route



Source: Ride Check, April and May 2016

Figure 8 | Saturday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest inbound weekday ridership stops on Route 29 are located on KU’s central campus, indicating the route is primarily utilized by students commuting to and from class (Figure 9). The stop at Budig Hall on Jayhawk Boulevard generates 519 combined daily boardings and alightings, and the stop at 15th Street and Green Hall averages 239 daily boardings and alightings. Stops at the Kansas Union (232 passengers), and Jayhawk Boulevard and Fraser Hall (108 passengers) also record more than 100 combined boardings and alightings. All other stops generate fewer than 90 combined daily boardings and alightings (Figure 10-Figure 13).

Traveling outbound, Bailey Hall Westbound generates 295 combined daily boardings and alightings, and Snow Hall Westbound averages 263 daily boardings and alightings. Other stops that feature more than 100 combined boardings and alightings per weekday include: Engineering, 24th Place and Inverness Drive, Kansas Union, and Jayhawk Boulevard and Lippincott Hall. These stops primarily serve academic buildings on KU’s central campus; the stop at 24th Place and Inverness Drive is located adjacent to several high-density off-campus student housing complexes. All other stops serve fewer than 100 boardings and alightings.

Saturday ridership on Route 29 is drastically lower than weekday ridership volumes (Figure 14-Figure 17). Ridership traveling in the outbound direction totals 39 passengers. Inbound, only 30 combined boardings and alightings are generated on Saturday.

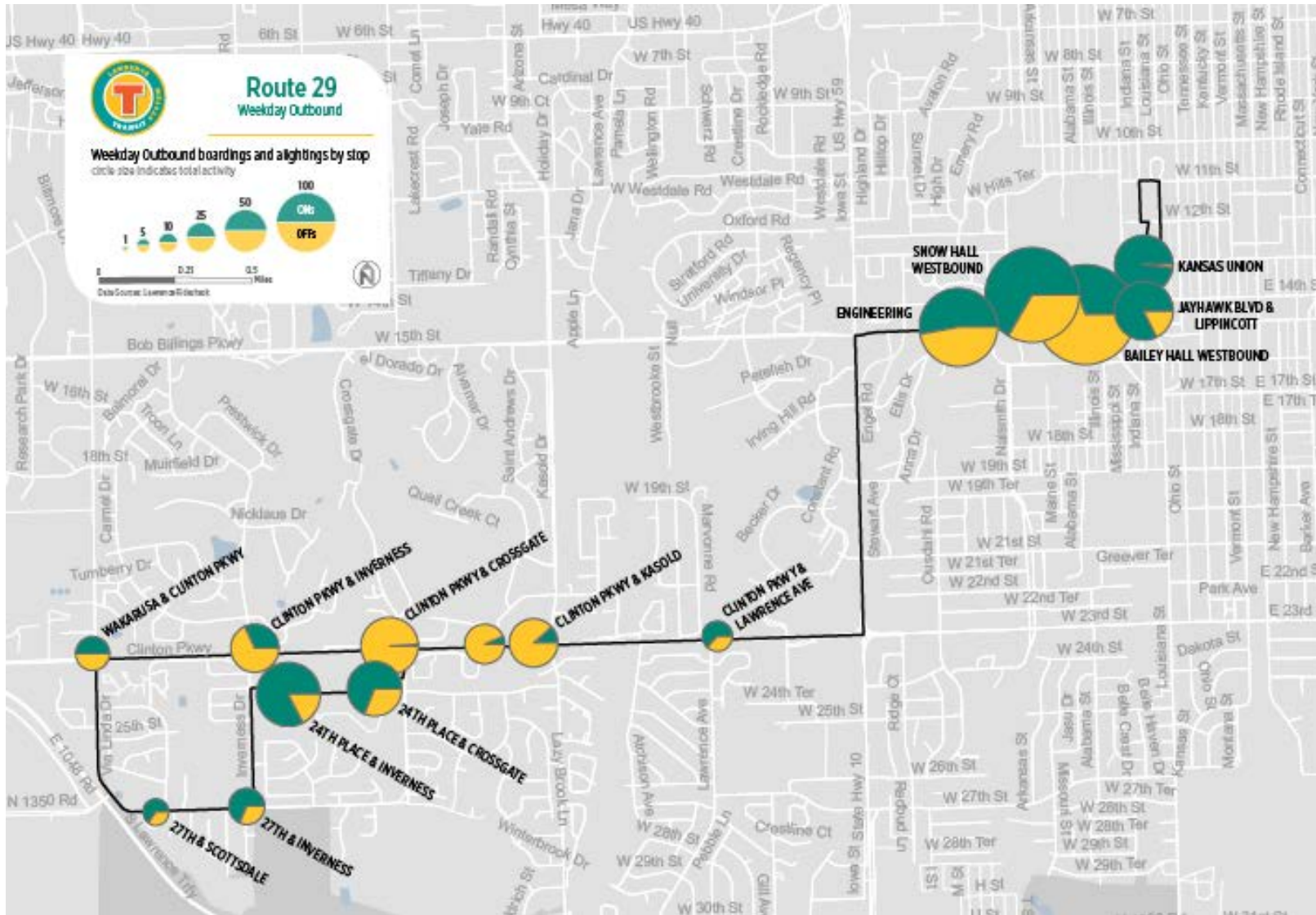
Figure 9 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Jayhawk Boulevard / Budig Hall	519	Budig Hall; KU campus
15th Street / Green Hall	239	Green Hall; Engineering; KU campus
Kansas Union	232	Kansas Union; KU campus
Jayhawk Boulevard / Fraser Hall	108	Fraser Hall; KU campus
24th Place / Crossgate Drive	88	Off-campus student housing

*Weekday inbound ridership (boardings and alightings) for Route 29 only

ROUTE EVALUATION | ROUTE 29
Coordinated Route

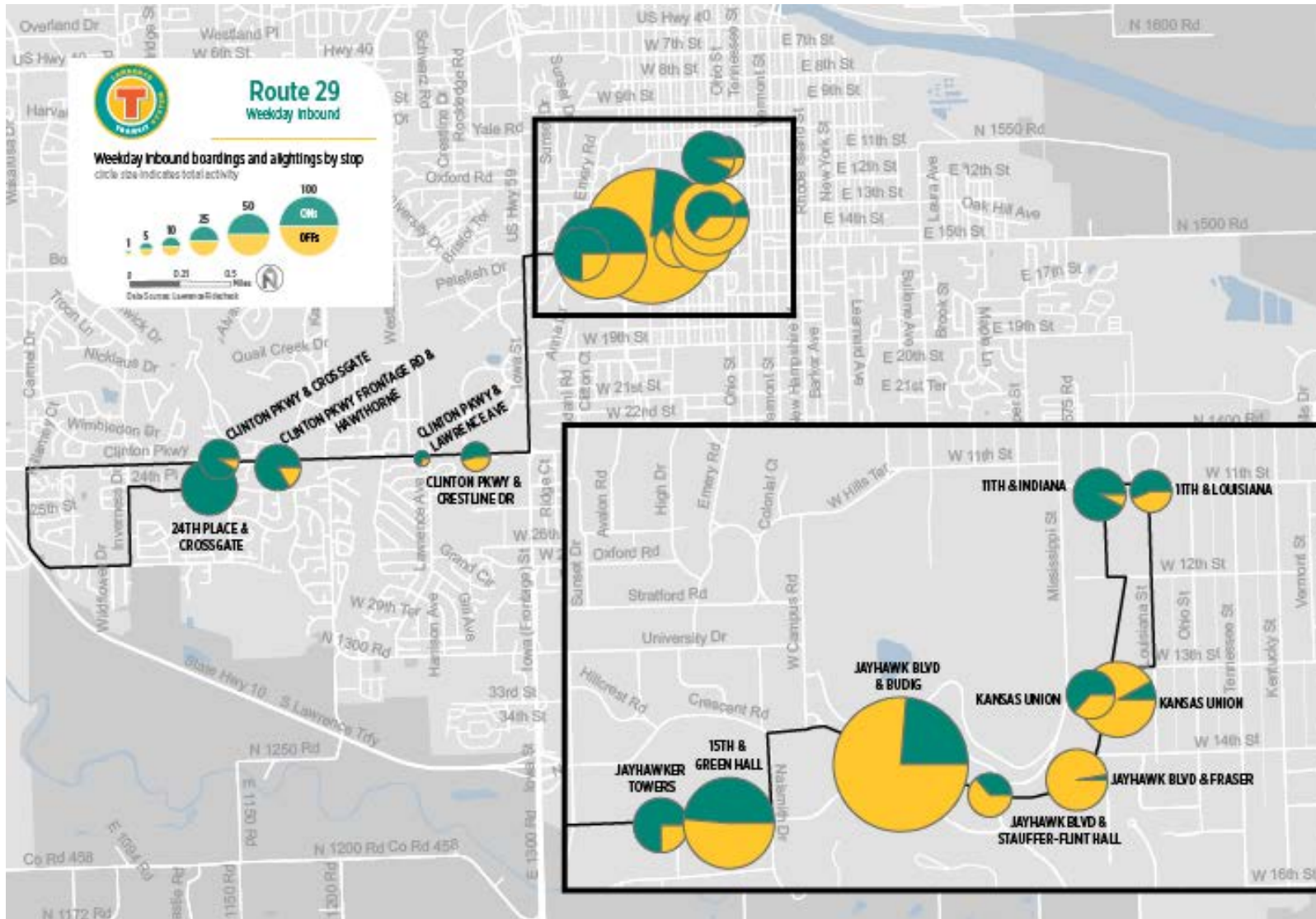
Figure 10 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

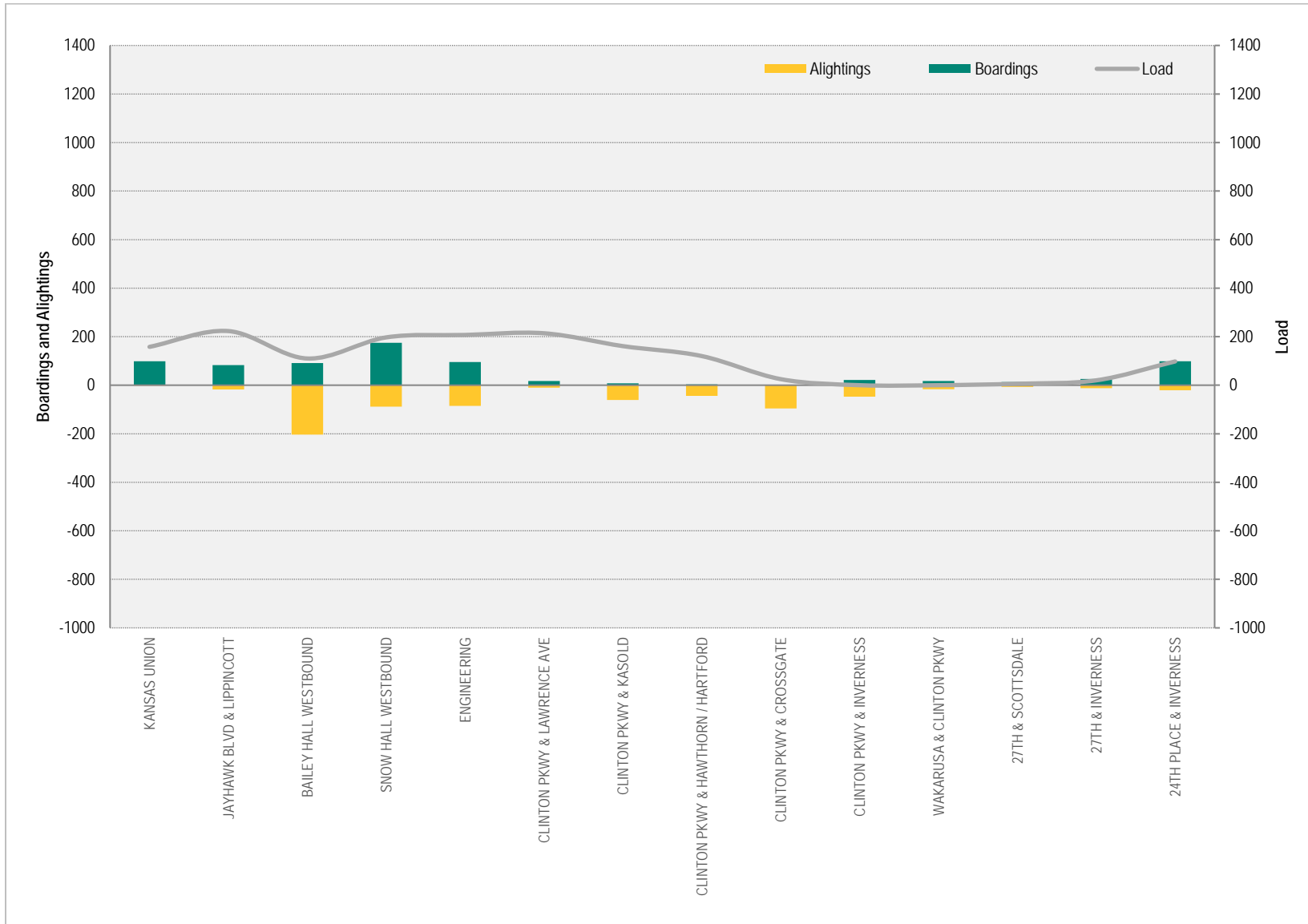
Figure 11 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

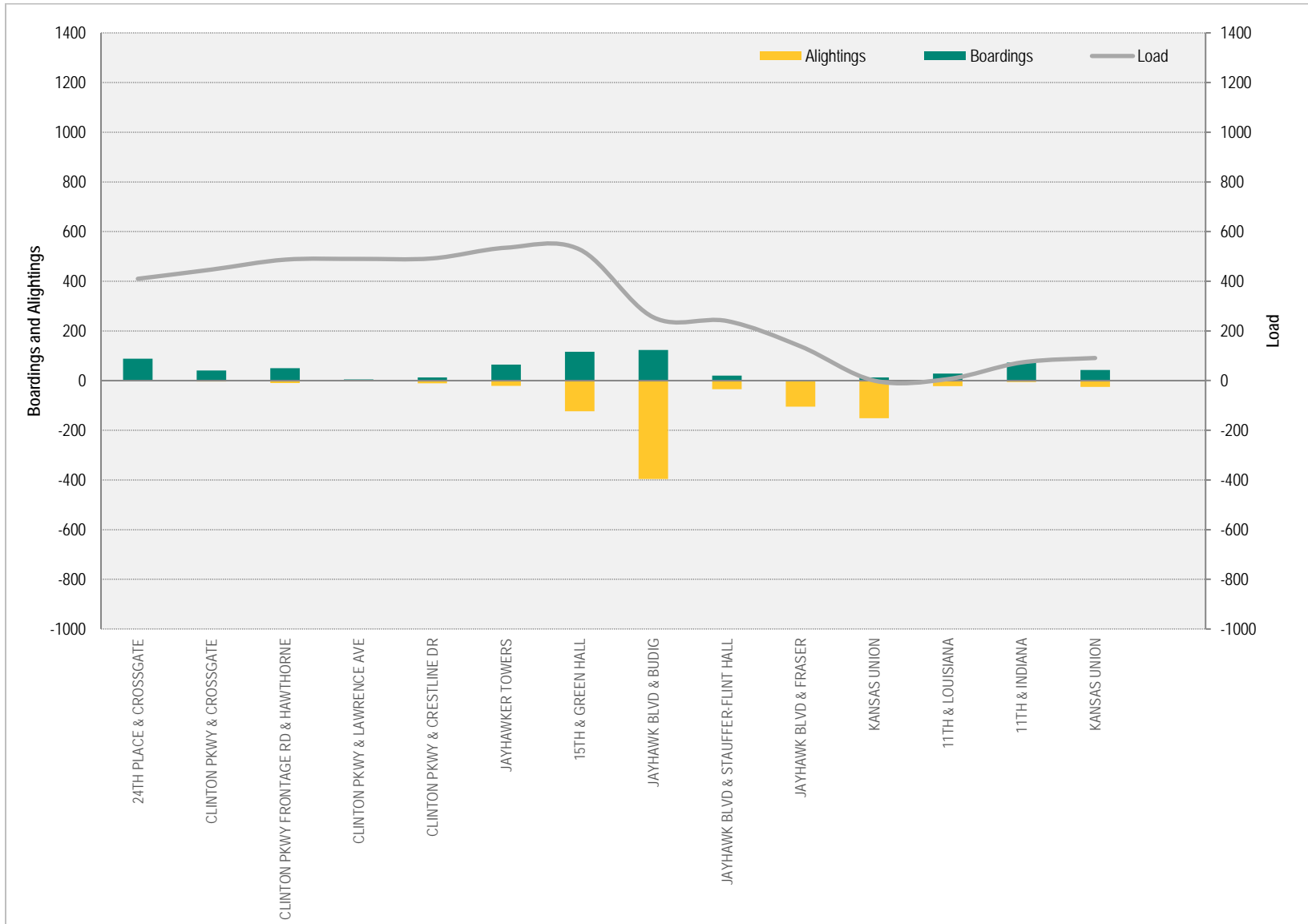
Figure 12 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

Figure 13 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

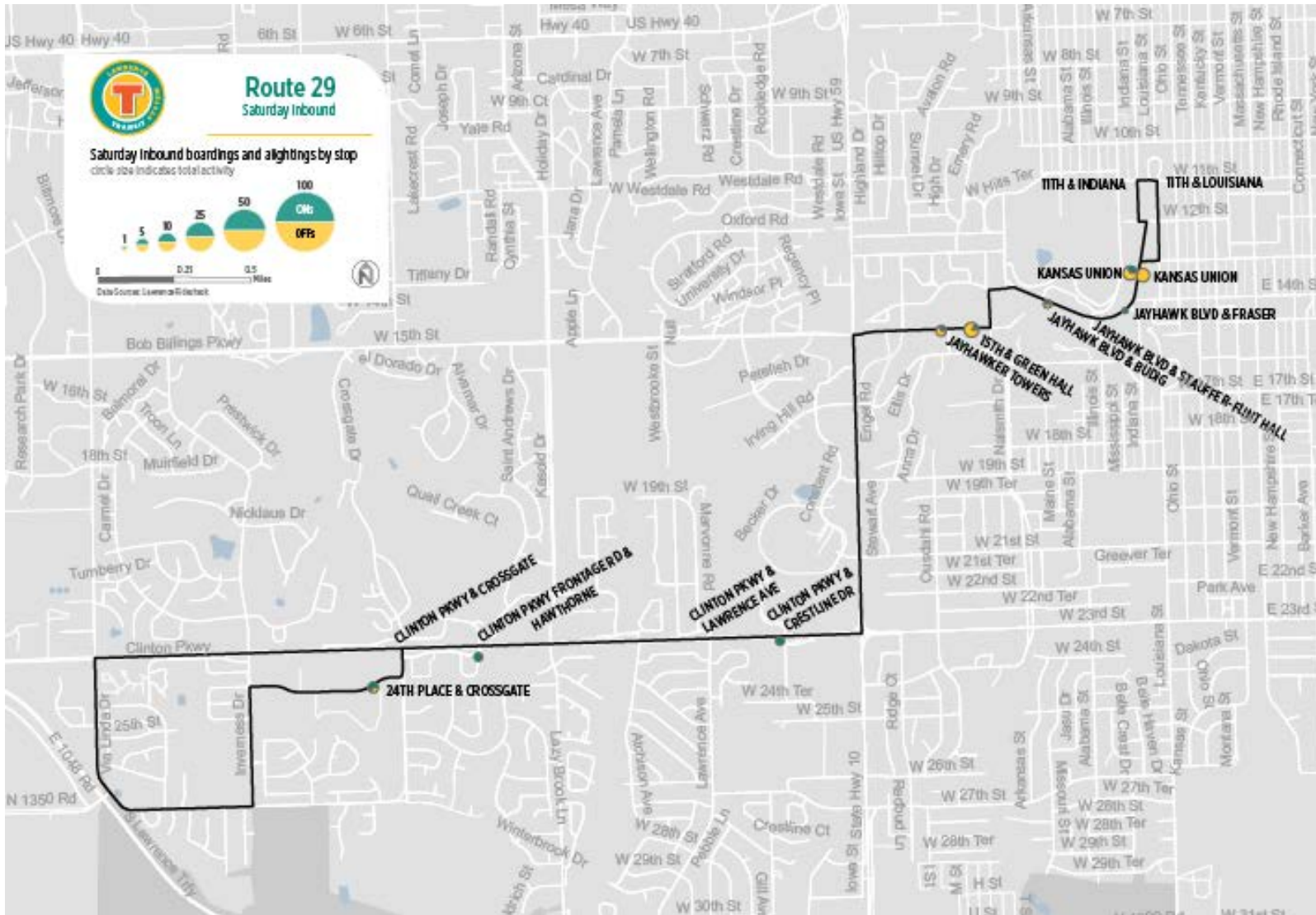
Figure 14 | Saturday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

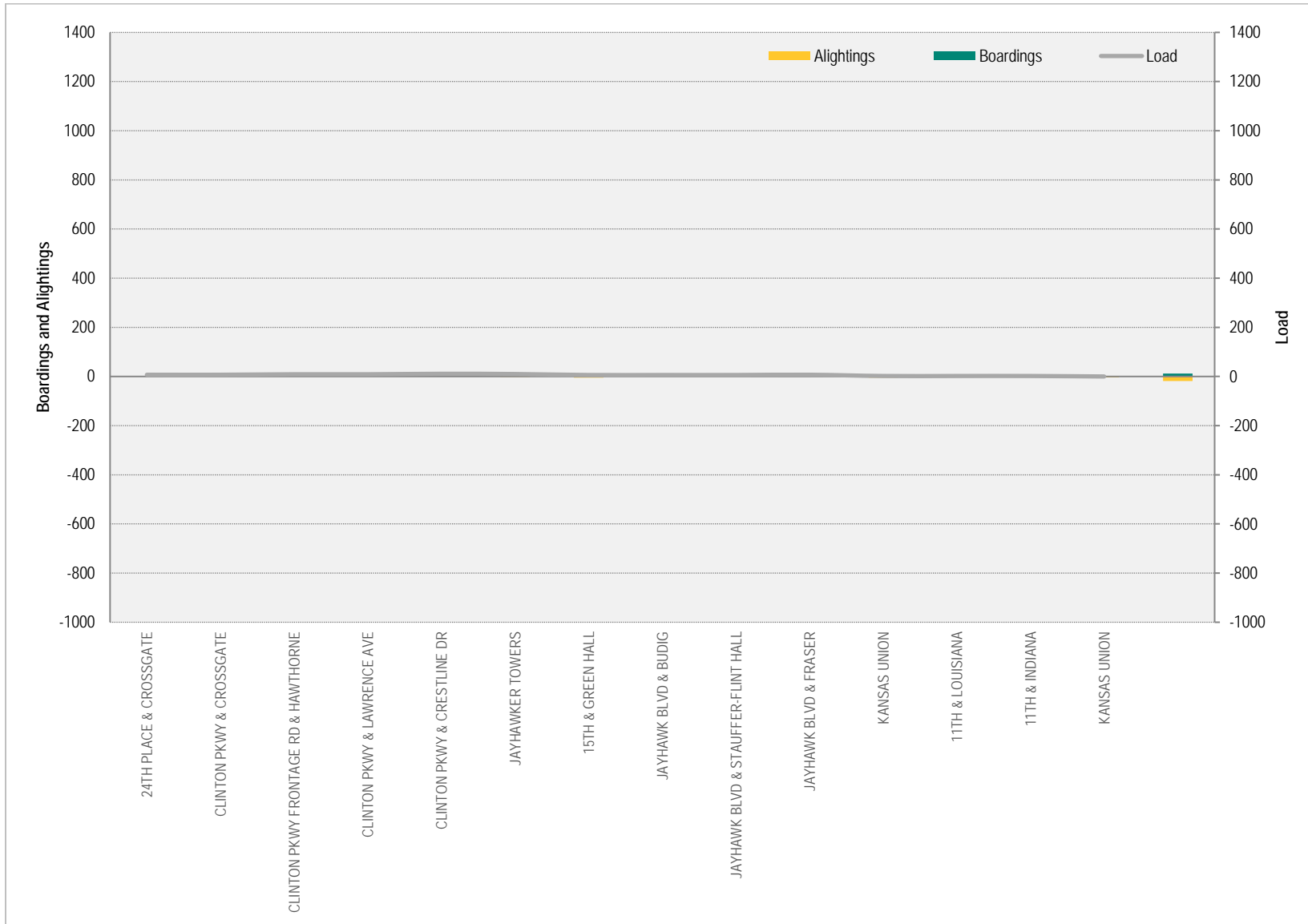
Figure 15 | Saturday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

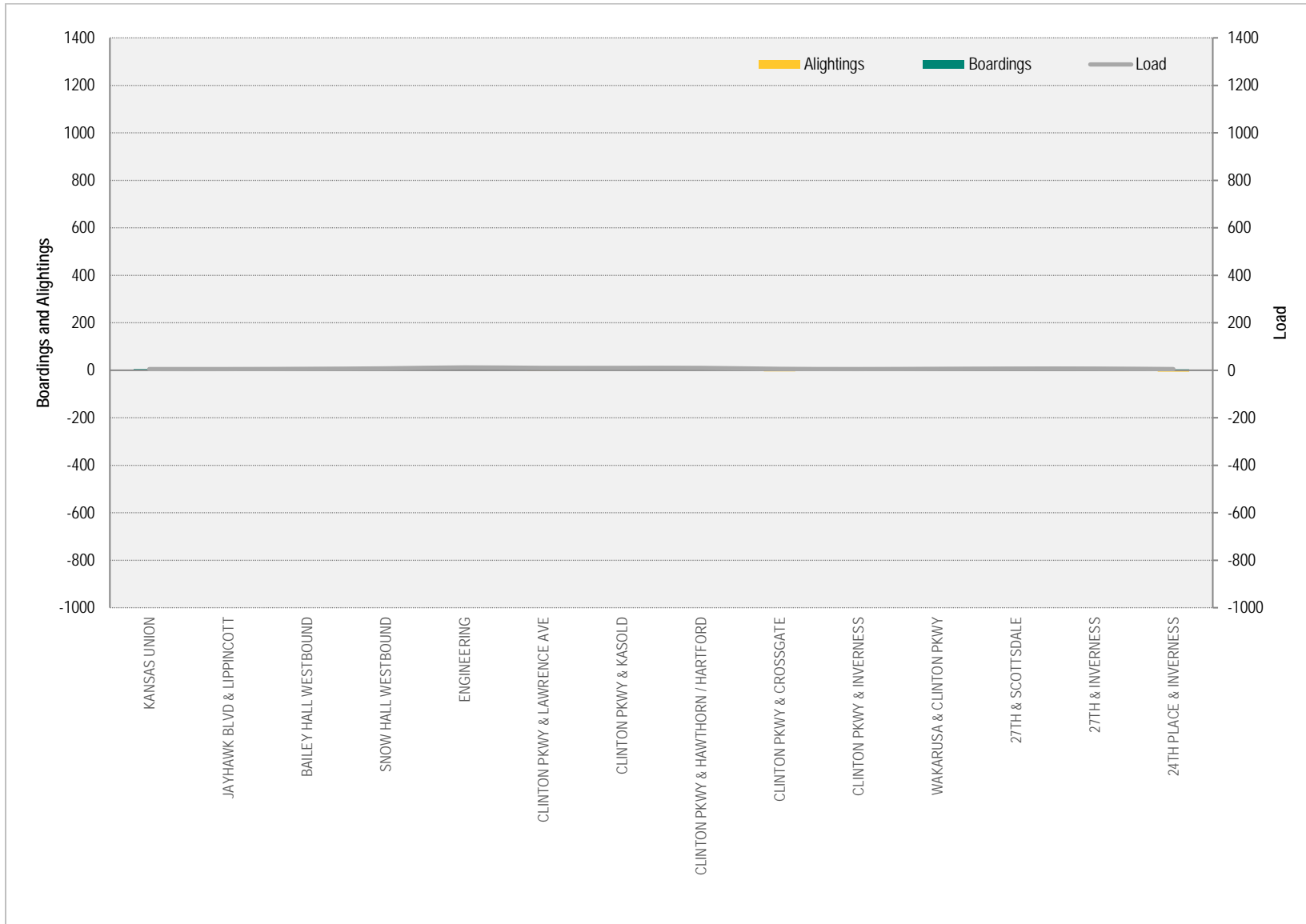
Figure 16 | Saturday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 29
Coordinated Route

Figure 17 | Saturday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

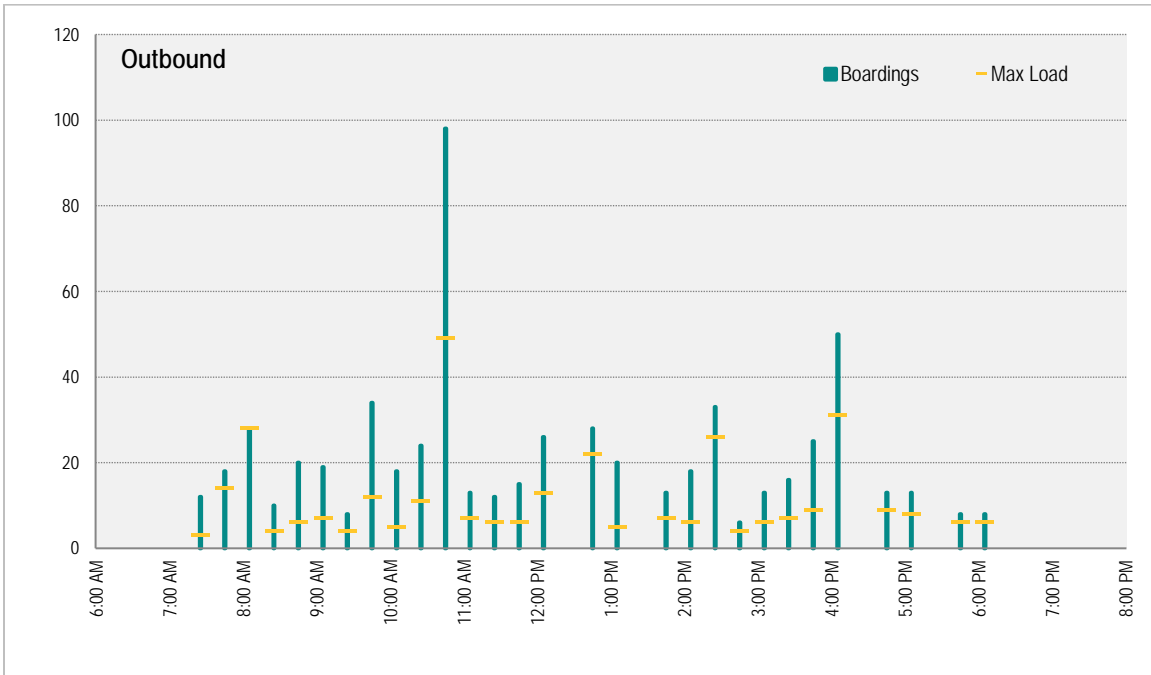
On weekdays, Route 29 inbound ridership is highest during the mid-morning and early afternoon service periods (9:30 AM to 1:00 PM), and peaks at 9:40 AM (45 passengers). No trips carry more than 12 passengers after 2:40 PM. Overall, 28% of inbound trips carry 20 passengers or more (Figure 18 and Figure 19).

Traveling outbound, ridership is highest during the mid-morning service period, with ridership in both directions peaking between 9:00 and 11:00 AM). Outbound ridership on Route 29 peaks at 10:45 AM, carrying 98 passengers. The second highest outbound trip occurs at 4:05 PM (50 passengers). Overall, 40% of outbound trips carry 20 passengers or more.

As a result of Route 29's extremely low Saturday ridership no discernable ridership trends by trip are evident (Figure 20 and Figure 21).

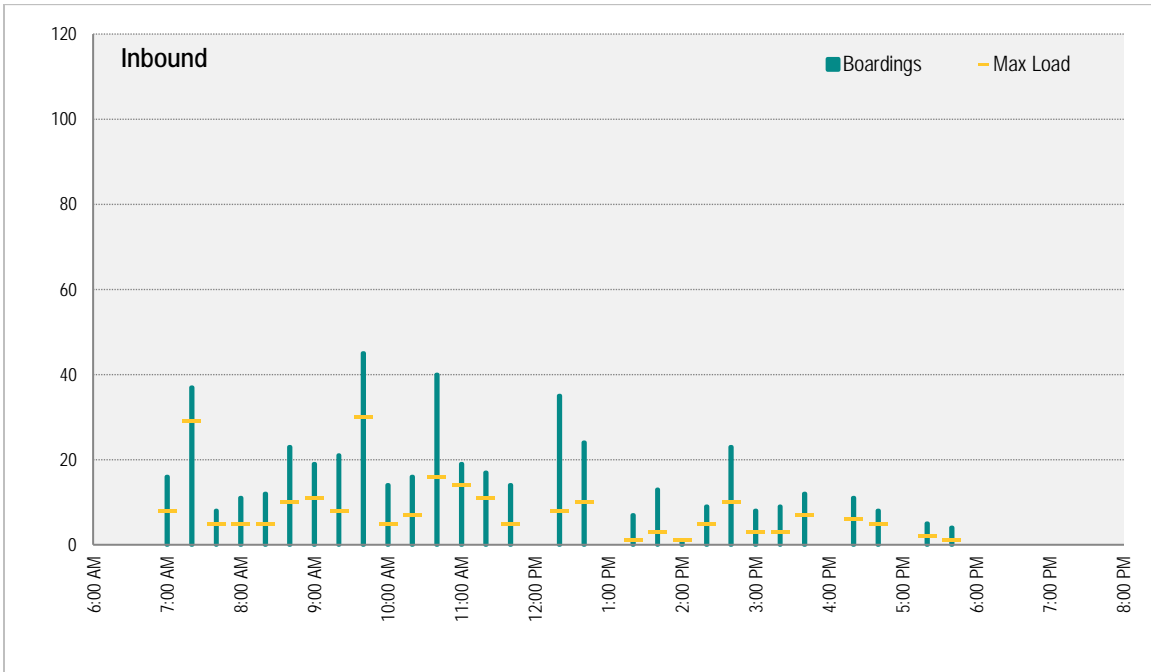
ROUTE EVALUATION | ROUTE 29
Coordinated Route

Figure 18 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 7:20 AM, 7:40 AM, 12:00 PM, 1:00 PM, 4:00 PM, and 5:00 PM outbound trips. Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

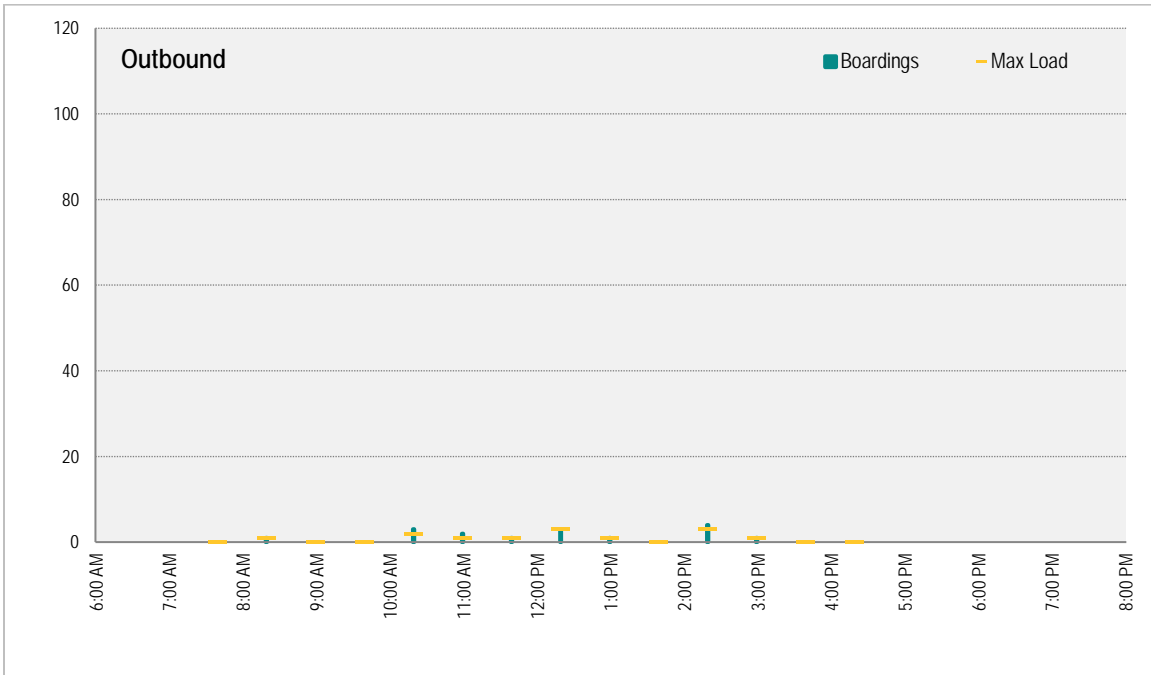
Figure 19 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 8:05 AM, 10:45 AM, 12:25 PM, 1:25 PM, 4:25 PM, and 5:25 PM inbound trips. Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

ROUTE EVALUATION | ROUTE 29
Coordinated Route

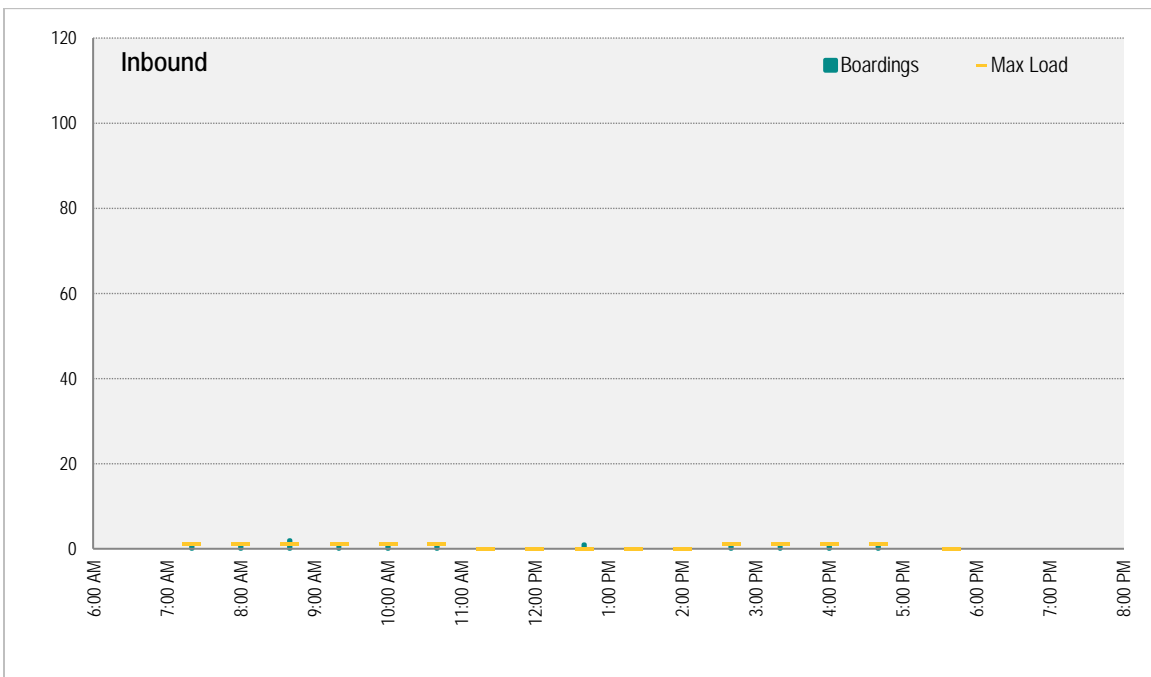
Figure 20 | Saturday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 21 | Saturday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

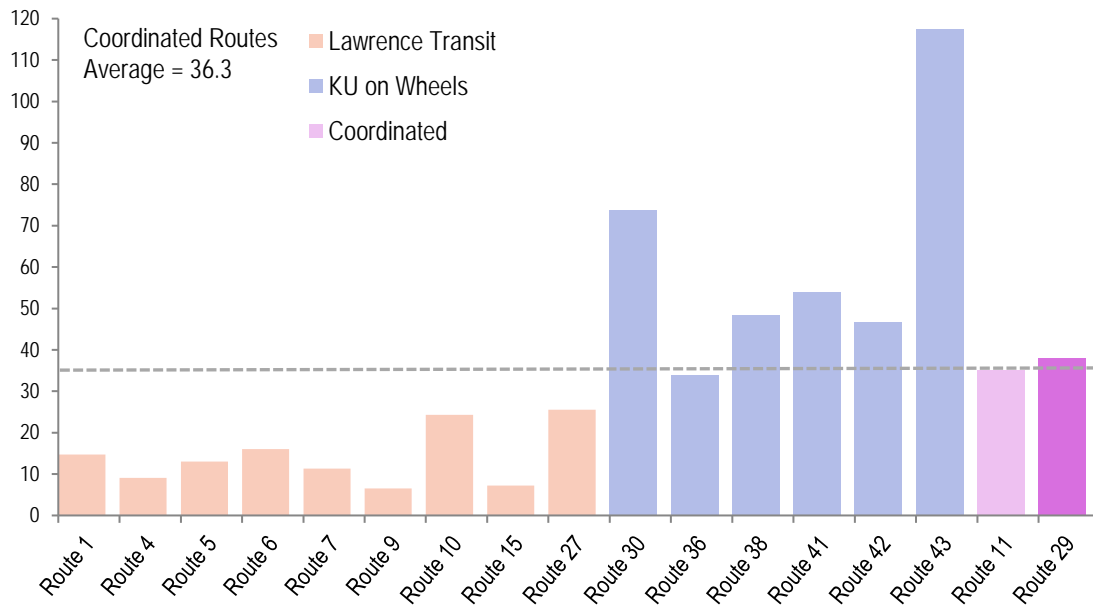
In terms of average passengers per hour, Route 29 is the most productive coordinated route (Figure 22). The route carries 38.1 passengers per hour on weekdays, exceeding the system average by 5% (Figure 23). Route 29 carries 4.4 passengers per hour on Saturdays (Figure 24). Decreased average ridership per hour on Saturday is likely a result of fewer KU students traveling from off-campus housing to campus.

Figure 22 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	COORDINATED ROUTES AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	1,123	29.5	38.1	36.3	1 of 2
Saturday	49	11.2	4.4	18.4	2 of 2

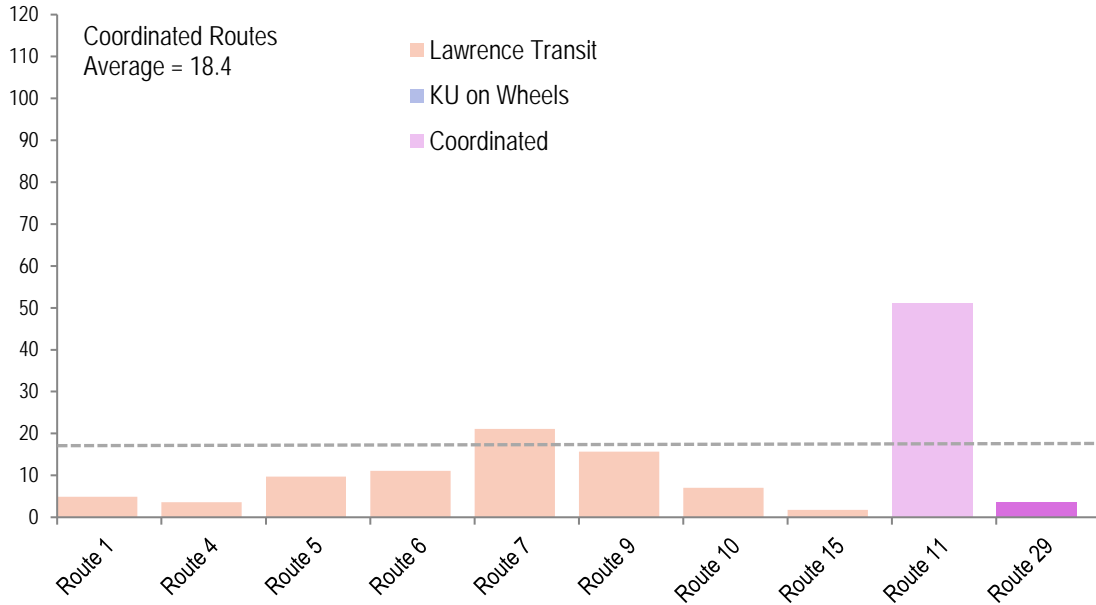
Source: Lawrence Transit, 2016

Figure 23 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

Figure 24 | Saturday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 26.3% of Route 29 time points were served “on-time” during the survey period (Figure 25). On Saturdays, approximately 12.5% of Route 29 time points were served “on-time” during the survey period.” Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Both weekday and Saturday on-time performance was affected heavily by late departures, with 64.7% of time points served late on weekdays and 82.5% served late on Saturday. Fewer than 10% of time points during each period experienced early departures.

Figure 25 | On-Time Performance

	WEEKDAY	SATURDAY
On-Time	26.3%	12.5%
Early	9.0%	5.0%
Late	64.7%	82.5%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 29 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Serve Retail Area at Iowa Street and 31st Street.** Current connections between the multi-family housing in southwest Lawrence and retail, jobs, and other essential services is relatively weak. Clinton Parkway is primarily residential, and most development is set far back from Iowa Street. In addition, ridership patterns suggest that a decent proportion of ridership boards and alights along Jayhawk Boulevard and W. 15th Street. If easy and fast transfer opportunities are maintained between Route 29 and other routes in the system that serve KU, it may be more worthwhile to serve the retail area at Iowa Street and 31st Street instead of the university with Route 29. This would create a one-seat ride to the retail area, and consolidate Jayhawk Boulevard ridership onto a different existing route.
- **Provide Alternate Alignments at Specific Times.** Most riders on Route 29 are students who need to reach the university during class times. To maintain a one-seat connection to the university when riders need it most, the Route 29 alignment could serve the university as it does now on weekdays or on weekdays between the start of service in the morning until about 4:30 PM, when ridership drops precipitously. On weekends and possibly on weekdays after 4:30 PM, Route 29 could serve the retail area at Iowa Street and 31st Street to provide more connections for students to jobs, shopping, and services.
- **Discontinue Saturday Service.** While Route 29 has strong ridership on weekdays, it has very few riders on Saturdays. This is primarily due to the lack of retail connections on the route. By contrast, Route 9, which serves two large retail centers, has higher ridership activity on Saturdays than on weekdays at stops shared with Route 29. If Route 9 continues along its current alignment, Saturday service should be discontinued due to low ridership.

KU on Wheels

ROUTE 30

Bob Billings & Kasold to KU

SERVICE DESIGN

Route 30 is a KU on Wheels route that operates between the Kansas Union and the intersection of 14th Street and Apple Lane. The route travels primarily along Jayhawk Boulevard, 15th Street, and Bob Billings Parkway (Figure 1). Route 30 connects the KU Main Campus to apartment complexes and shopping centers just north of Bob Billings Parkway.

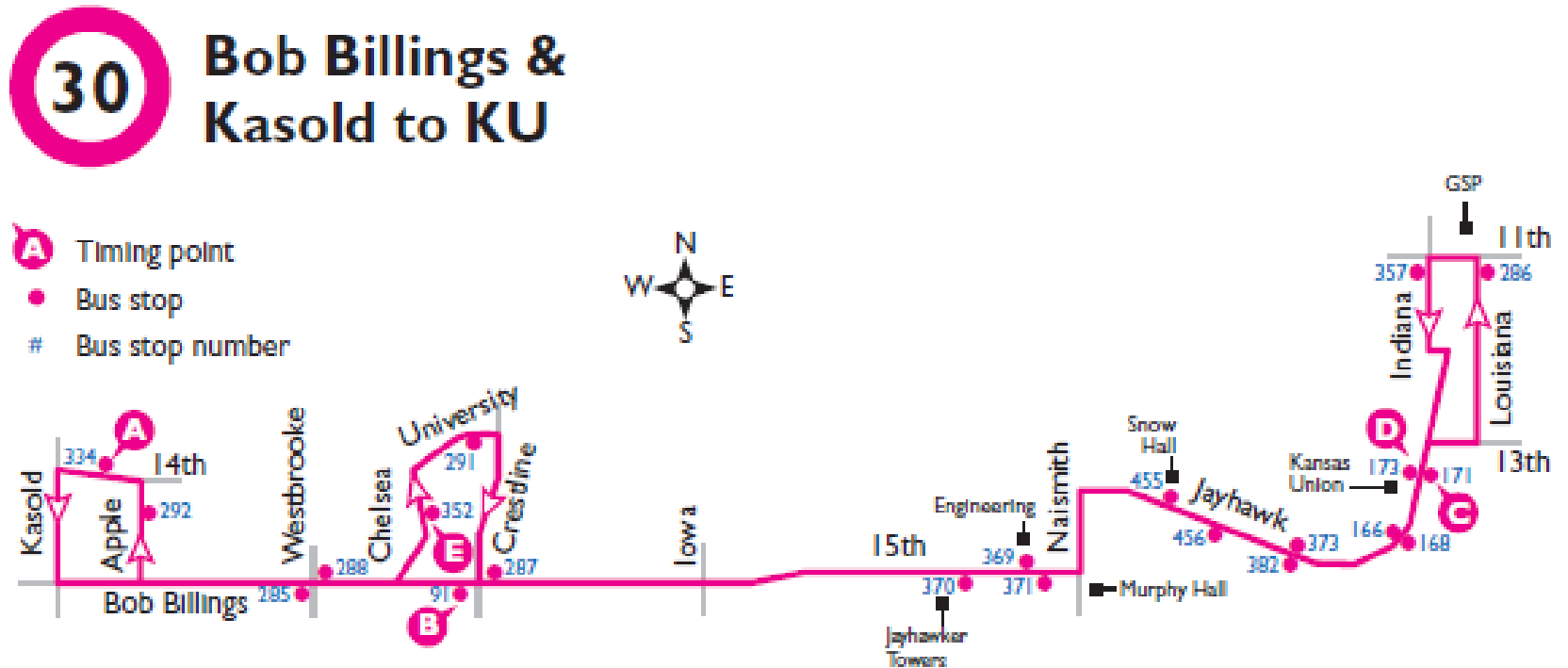
ALIGNMENT/SERVICE PATTERNS

Route 30 has a single consistent service pattern for weekday service. Departing outbound from the Kansas Union, Route 30 travels southwest on Jayhawk Boulevard, turns left on Naismith Drive, right on 15th Street, and then continues straight across Iowa Street to Bob Billings Parkway. The route then loops through the Meadowbrook Apartments by turning right on Chelsea Place, right on University Drive, right on Crestline Drive, and then right to return to Bob Billings Parkway. Route 30 then turns right on Apple Lane before terminating at the intersection with 14th Street.

Returning inbound from 14th Street and Apple Lane, Route 30 turns left on 14th Street, left on Kasold Drive, left on Bob Billings Parkway, and then bypasses the Meadowbrook Apartments loop before continuing to the Kansas Union. After serving the Kansas Union, Route 30 completes a turnaround loop by turning right on 13th Street, left on Louisiana Street, left on 11th Street, left on Indiana Street, left on 12th Street, right on Oread Avenue and then ending service at the Kansas Union.

The first two outbound trip begin at Chelsea Place rather than at the Kansas Union, and then continues towards 14th Street and Apple Lane along the regular alignment.

Figure 1 | Route Map



Source: Lawrence Transit: August 2015-August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 30 and several Lawrence Transit and KU on Wheels routes at the Kansas Union. There are also transfer opportunities at several other points along the route, including along 15th Street (Route 10 and Route 43), and at 11th Street and Louisiana Street (Route 10, Route 11, Route 29) (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Jayhawk Boulevard (Kansas Union and Snow Hall)	Kansas Union: Routes 11, 29, 30, 36, 38, and 43; Snow Hall: All routes at Union plus Route 27, 41, and 42
11th Street and Louisiana Street	Route 10, Route 11, Route 29
Jayhawker Towers (15th Street and Burdick Drive)	Route 10, Route 29, Route 43

SERVICE SCHEDULE

Route 30 operates from Monday-Friday when KU is in session (Figure 3). On weekdays, the route runs every 20 minutes from 7:10 AM to 5:57 PM. Route 30 does not run on Saturdays, Sundays, or when KU is not in session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	7:10 AM – 5:57 PM	20	33/31
Saturday	No service	–	–
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 30 ranks third of six KU on Wheels routes in terms of weekday ridership and third of six in terms of ridership per trip (Figure 4). On average, the route carries 1,278 passengers, or 20 passengers per trip, on Monday-Friday (Figure 5 and Figure 6).

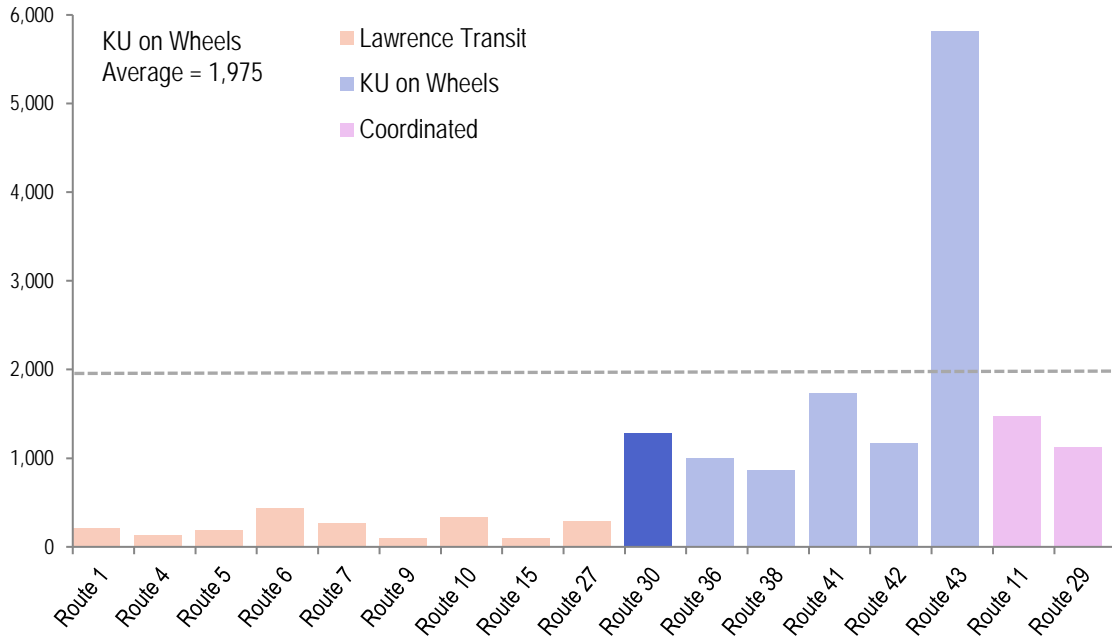
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	KU ON WHEELS AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	1,278	64	20.00	22.8	3 of 6

Source: Lawrence Transit, 2016

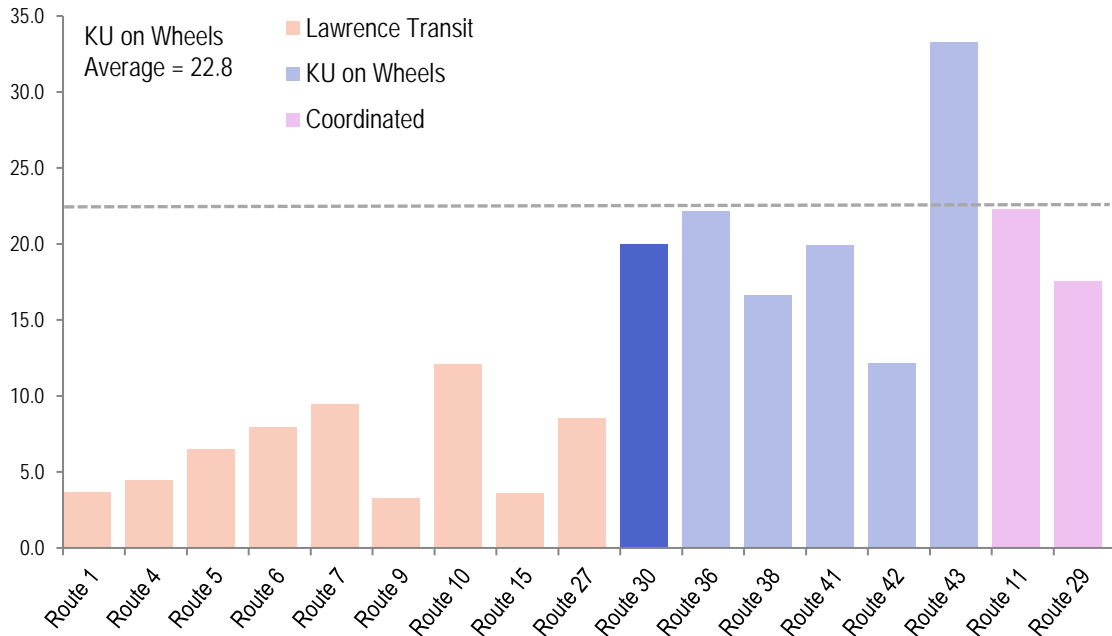
ROUTE EVALUATION | ROUTE 30
 KU on Wheels

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stop traveling in the inbound direction is Budig Hall, on KU’s main campus: on average the stop generates 543 combined daily boardings and alightings. Stops at 15th Street and Green Hall and at the Kansas Union each average over 200 boardings and alightings, while stops at Jayhawk Boulevard and Fraser Hall, Bob Billings and Crestline Drive, and 11th Street and Indiana Street generate more than 100 average daily boardings and alightings (Figure 7).

Stops with the highest weekday outbound ridership on Route 30 are located on KU’s campus and near off-campus housing. Stops at Snow Hall and Chelsea Place (off Bob Billings Parkway) each generate more than 200 combined daily boardings and alightings. Additionally, stops at Bailey Hall, University Drive at Crestline Drive, the Engineering Department, and Apple Lane generate more than 100 daily boardings and alightings. These stops serve dense off-campus residential areas and KU’s main campus; the stop at Apple Lane is one block from several local and retail stores. All other stops serve fewer than 90 boardings and alightings (Figure 8-Figure 11).

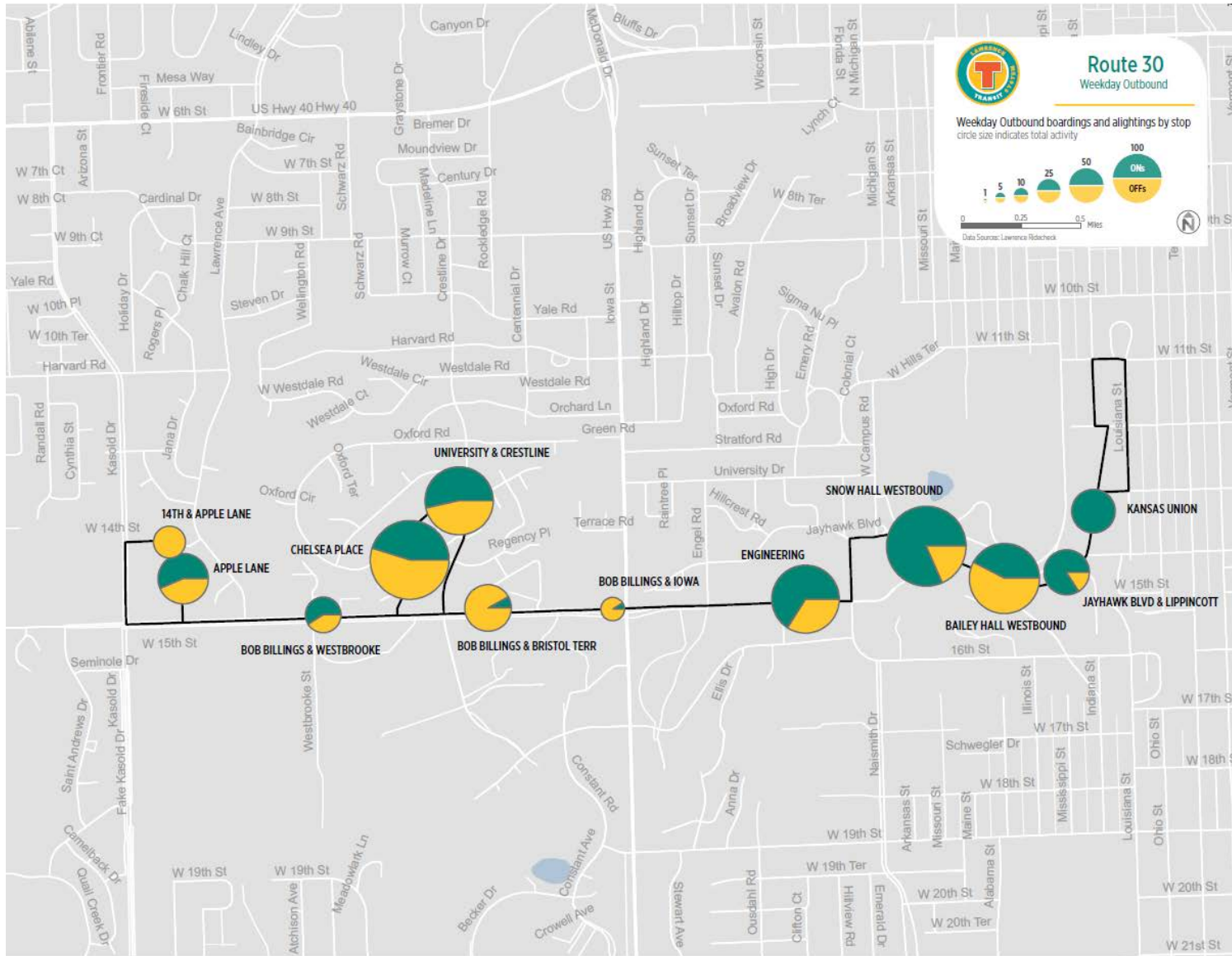
Figure 7 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Budig Hall	543	Budig Hall, KU’s main campus
Kansas Union	235	Kansas Union, KU’s main campus
15th Street / Green Hall	232	Engineering Department, KU’s main campus
Bob Billings / Crestline	176	Off-campus residential communities; KU Public Safety Office
Jayhawk Boulevard / Fraser Hall	183	Fraser Hall, KU’s main campus

*Weekday Inbound ridership (boardings and alightings) for Route 30 only

ROUTE EVALUATION | ROUTE 30
KU on Wheels

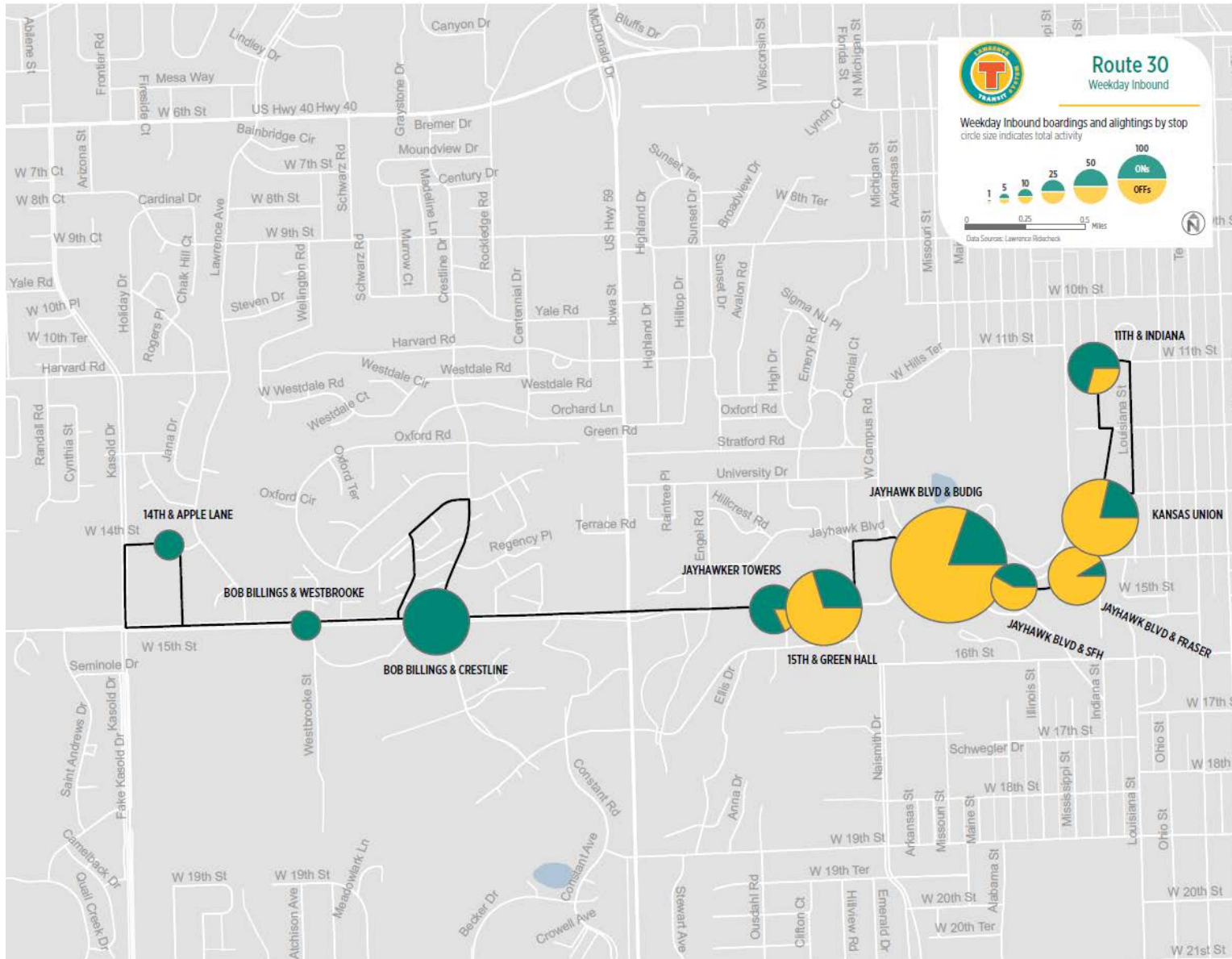
Figure 8 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 30
KU on Wheels

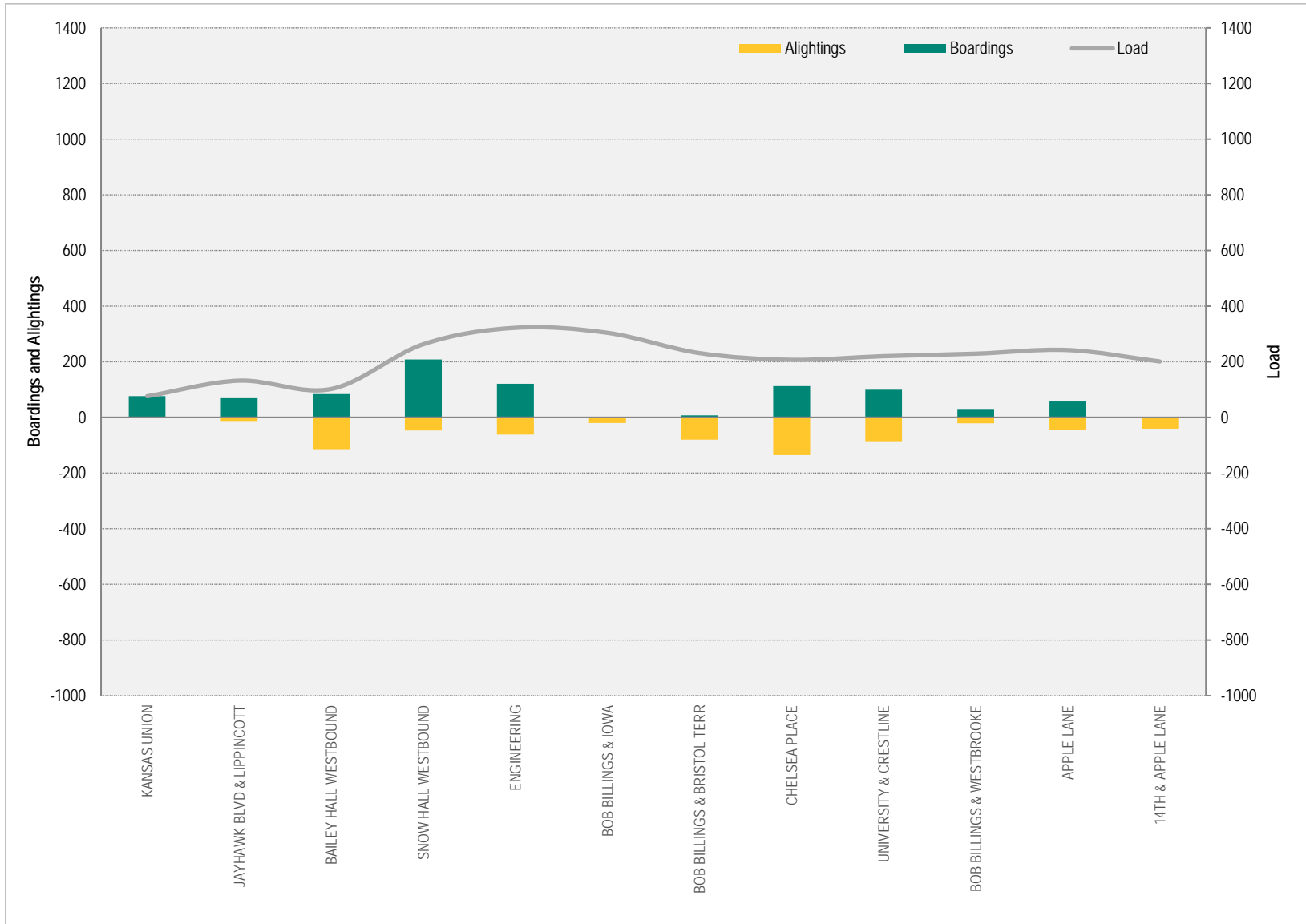
Figure 9 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 30
 KU on Wheels

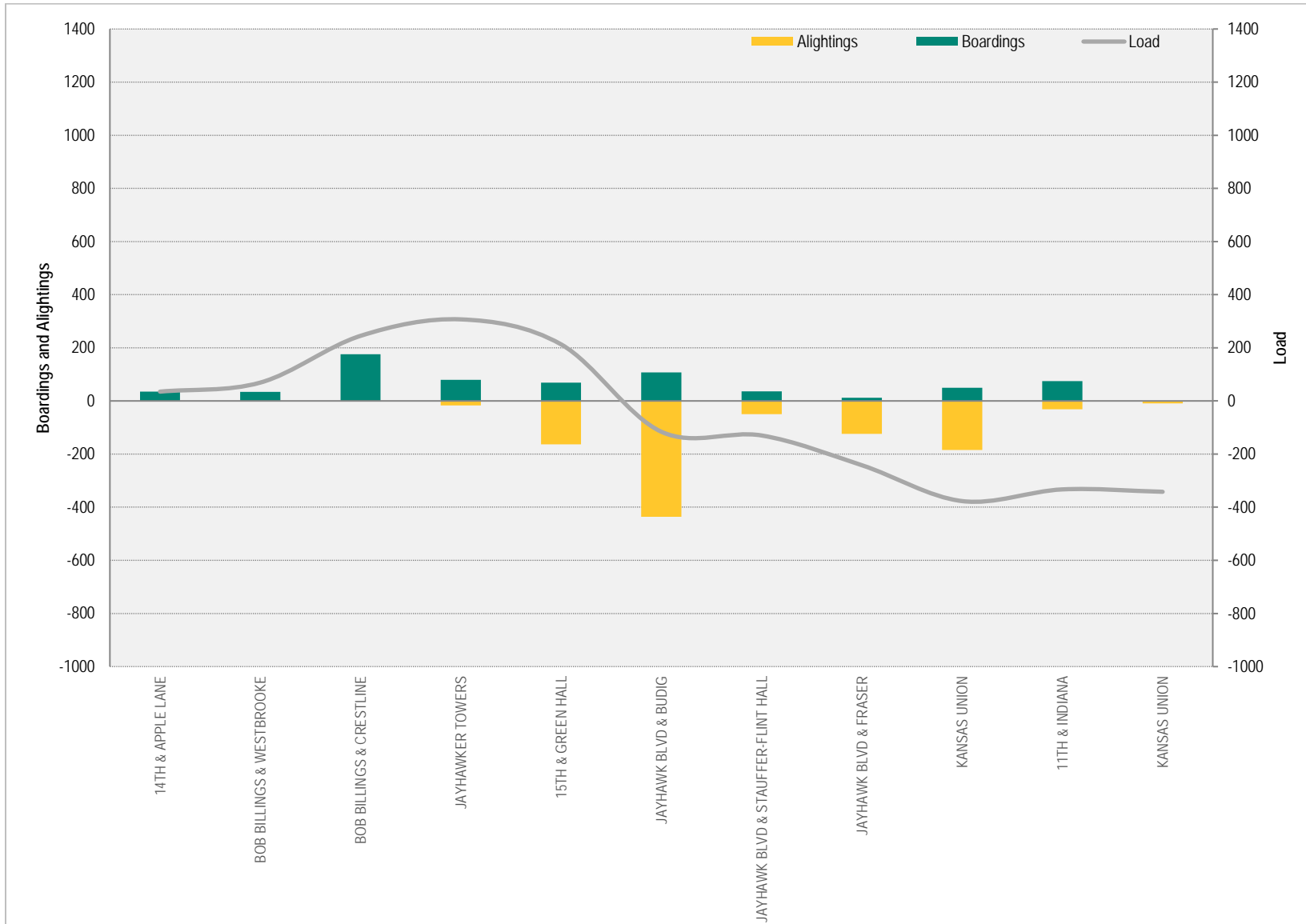
Figure 10 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 30
KU on Wheels

Figure 11 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

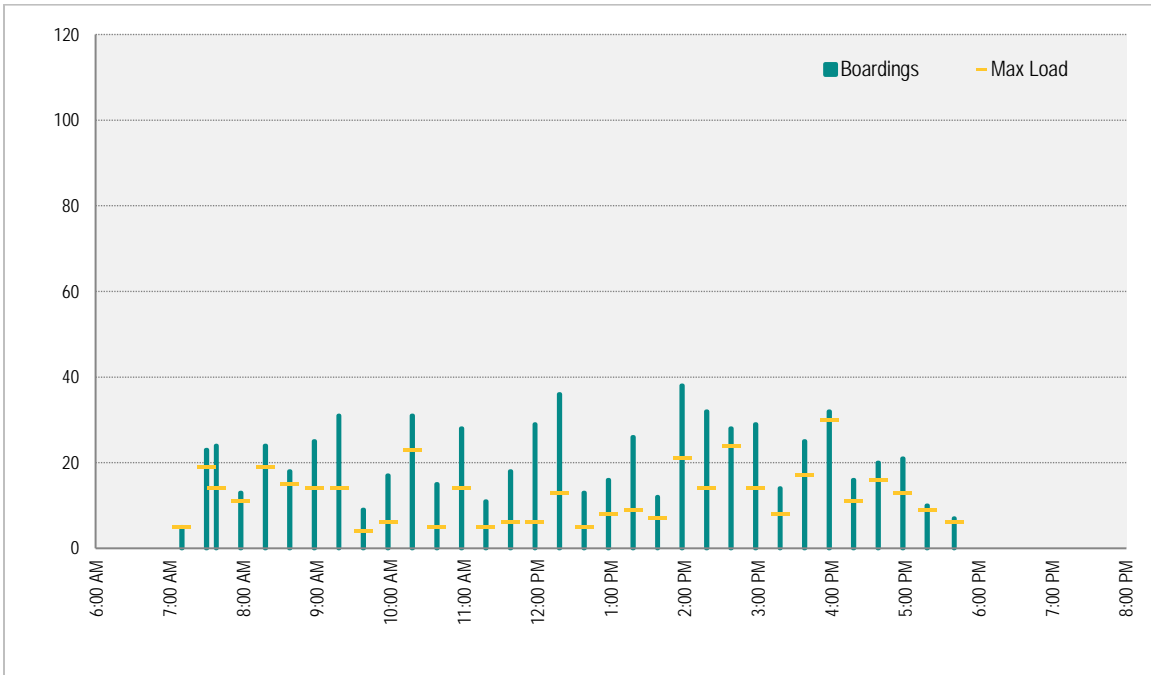
RIDERSHIP BY TRIP

On weekdays, Route 30 ridership is highest during the mid-morning and mid-afternoon service periods (Figure 12 and Figure 13). Traveling outbound, ridership on Route 30 is consistently high throughout the day, peaking at 2:00 PM, with 38 boardings. Over 50% of all inbound trips on Route 30 record 20 boardings or more. Six inbound trips average more than 30 passengers, while only three trips carry fewer than 10 passengers.

Inbound ridership is highest mid-morning and peaks at 10:35 AM, carrying 45 passengers (Figure 13). A secondary peak occurs between 12:30 and 2:30 PM, when five trips average more than 20 passengers. While five trips average over 30 boardings, nearly 30% of all outbound trips carry fewer than 10 passengers.

Several trips in both directions exceed seated capacity (35-40 passengers), which can lead to passengers standing.

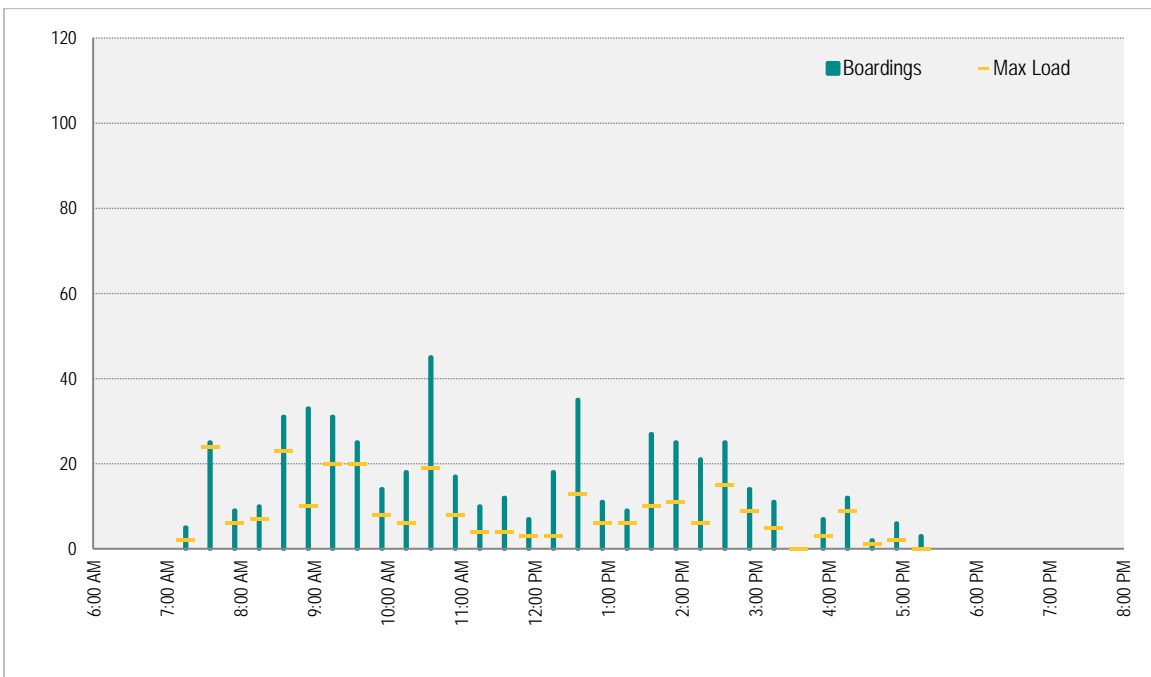
Figure 12 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 13 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016. No data was collected for the 7:30 and 10:18 AM inbound trips.

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

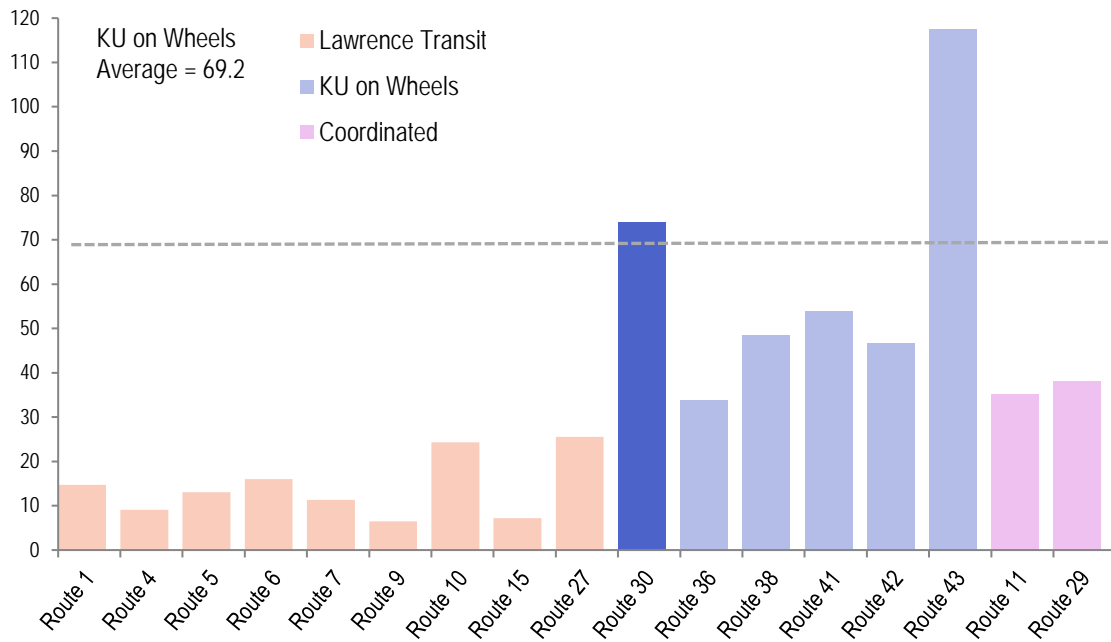
In terms of average passengers per hour, Route 30 is the second most productive KU on Wheels bus route (Figure 14). The route carries 73.9 passengers per hour on weekdays, exceeding the system average by 7% (Figure 15).

Figure 14 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	KU ON WHEELS AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday – Friday	1,278	17.3	73.9	69.2	2 of 6

Source: Lawrence Transit, 2016

Figure 15 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 39.6% of Route 30 time points were served “on-time” during the survey period (Figure 16). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected primarily by late departures, with 57.5% of time points served five minutes or more behind schedule.

Figure 16 | On-Time Performance

WEEKDAY	
On-Time	39.6%
Early	2.8%
Late	57.5%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 30 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Consider Interlining Route 30 with Another Route.** As a very short route (40-minute roundtrip including an 8-minute layover) that originates and terminates at the KU Union, Route 30 could be interlined with another route to create more one seat ride opportunities and connections to other points of interest for students. Currently the route primarily connects the university to off-campus student housing. Interlining Route 30 with another route could also help improve its on-time performance by optimizing cycle time and recovery time.
- **Expand Route to Serve Retail Destinations.** Route 30 is currently designed to connect off-campus apartments to the KU campus. Linking these apartments to near-by retail destinations on 6th Street and/or 9th Street could make transit an attractive option for more trip types, beyond just school trips.
- **Operate 30-Minute Service on Saturdays.** Offering Saturday service on Route 30 would benefit students, enabling connections to the university that would otherwise be difficult to make on weekends. As a direct, high performing route on weekdays, Route 30 is a good candidate for weekend service, especially if additional retail, university, and/or city connections are made on the route.

KU on Wheels

ROUTE 36

6th via Emery to KU

SERVICE DESIGN

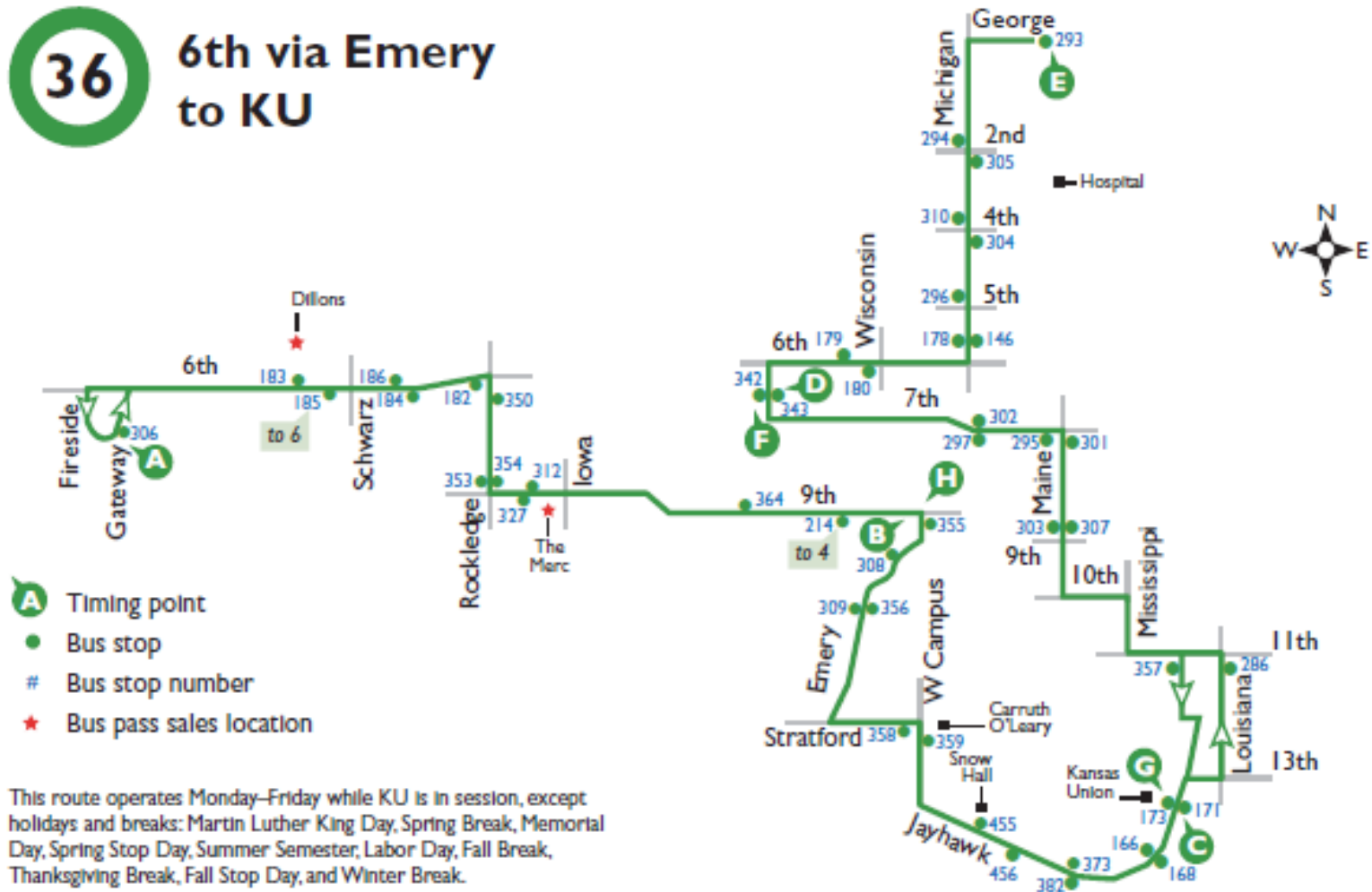
Route 36 is a KU on Wheels route that operates between the Gateway Court Apartments and the Northwind Apartments via the KU Main Campus. The route travels primarily along 6th Street, 8th Street, Emery Road, Jaywalk Boulevard, Maine Street, 7th Street, and Michigan Street (Figure 1). Route 36 provides service to Dillons, Hillcrest Shopping Center, the KU Main Campus, The Oread Hotel, and Lawrence Memorial Hospital.

ALIGNMENT/SERVICE PATTERNS

Route 36 has a single consistent service pattern for weekday service. Departing outbound from the Gateway Court Apartments, Route 36 turns right on 6th Street, right on Rockledge Road, left on 9th Street, right on Emery Road, left on Stratford Road, right on West Campus Road, and right on Jayhawk Boulevard to reach the Kansas Union. From the Kansas Union, outbound service continues right on 13th street, left on Louisiana Street, left on 11th Street, right on Mississippi Street, left on 10th Street, right on Main Street, left on 7th Street, right on 6th Street, left on Michigan Street, and right on George Court before terminating at the Northwind Apartments.

Returning inbound from the Northwind Apartments, Route 36 uses the outbound alignment until the intersection of 11th Street and Indiana Street. The inbound alignment turns right on Indiana Street, left on 12th Street, right on Oread Avenue to reach the Kansas Union. From the Kansas Union, inbound service returns to the outbound alignment before terminating at the Gateway Court Apartments.

Figure 1 | Route Map



Source: Lawrence Transit: August 2015-August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 36 and several Lawrence Transit and KU on Wheels routes at the Kansas Union. There are also transfer opportunities at several other locations along the route, including along 6th Street (Route 6), 9th Street (Route 4), and Michigan Street (Route 6) (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Kansas Union	Route 10, Route 11, Route 29, Route 36, Route 38, Route 43
9th Street and Avalon Road	Route 4
Snow Hall	Route 10, Route 11, Route 27, Route 29, Route 30, Route 38, Route 41, Route 42, Route 43
6th Street and Schwarz Road/Lawrence Avenue	Route 6

SERVICE SCHEDULE

Route 36 operates service Monday-Friday when KU is in session (Figure 3). On weekdays, the route runs every 30 minutes from 7:02 AM to 6:27 PM. Route 36 does not run on Saturdays, Sundays, or when KU is not in session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	7:02 AM – 6:27 PM	30	22/22
Saturday	No service	–	–
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 36 ranks fifth of six KU on Wheels routes in terms of weekday ridership and second of six in terms of ridership per trip (Figure 4). On average, the route carries 998 passengers, or 22.2 passengers per trip, on Monday-Friday (Figure 5 and Figure 6).

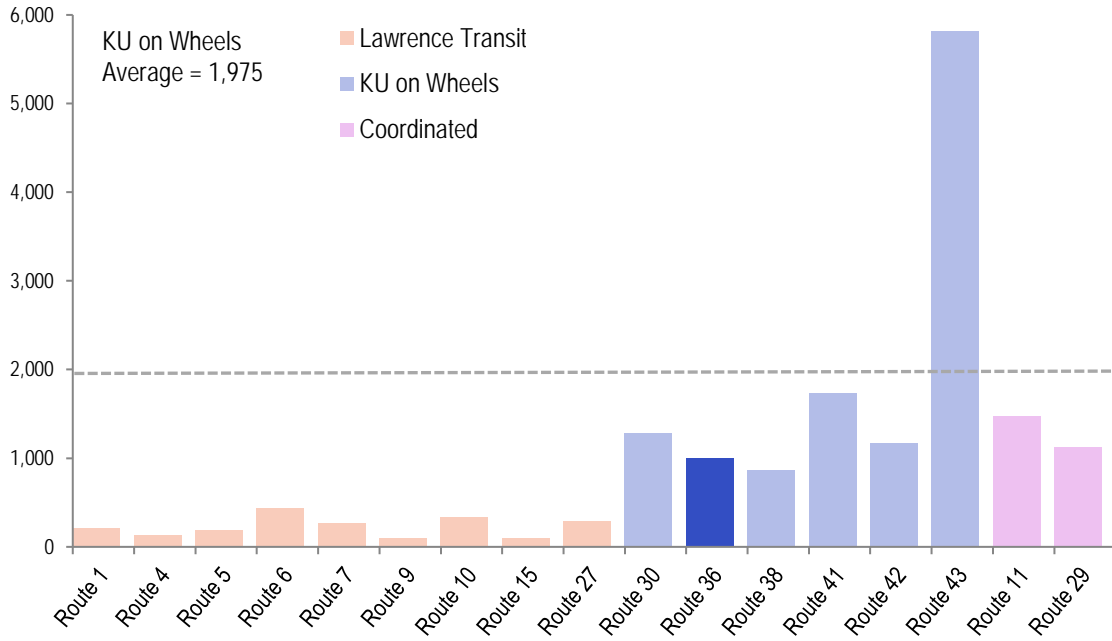
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	KU ON WHEELS AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	998	44	22.2	22.8	2 of 6

Source: Lawrence Transit, 2016

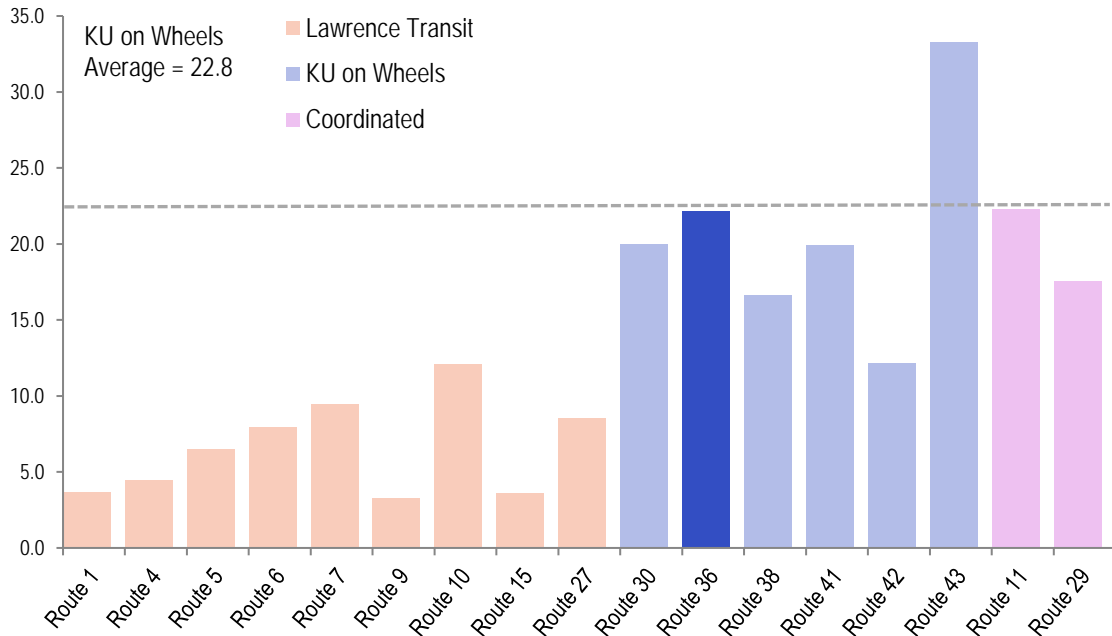
ROUTE EVALUATION | ROUTE 36
 KU on Wheels

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 36 are located on or near the campus of KU. These stops primarily serve KU’s main campus, along with off-campus residential communities (fraternity and sorority houses and apartment buildings). Traveling inbound, the stop with the highest combined boardings and alightings on Route 36 is Snow Hall, followed by Bailey Hall (Figure 7).

In the outbound direction, the stops with the highest combined boardings and alightings are at Jayhawk Boulevard and Budig Hall (350 boardings and alightings), followed by the stop at the Kansas Union (245 boardings and alightings). Other stops with more than 100 average daily boardings and alightings per weekday include: Emery Road at Sigma Nu Place and 9th Street at Emery Road. All other outbound stops serve fewer than 90 boardings and alightings (Figure 8-Figure 11).

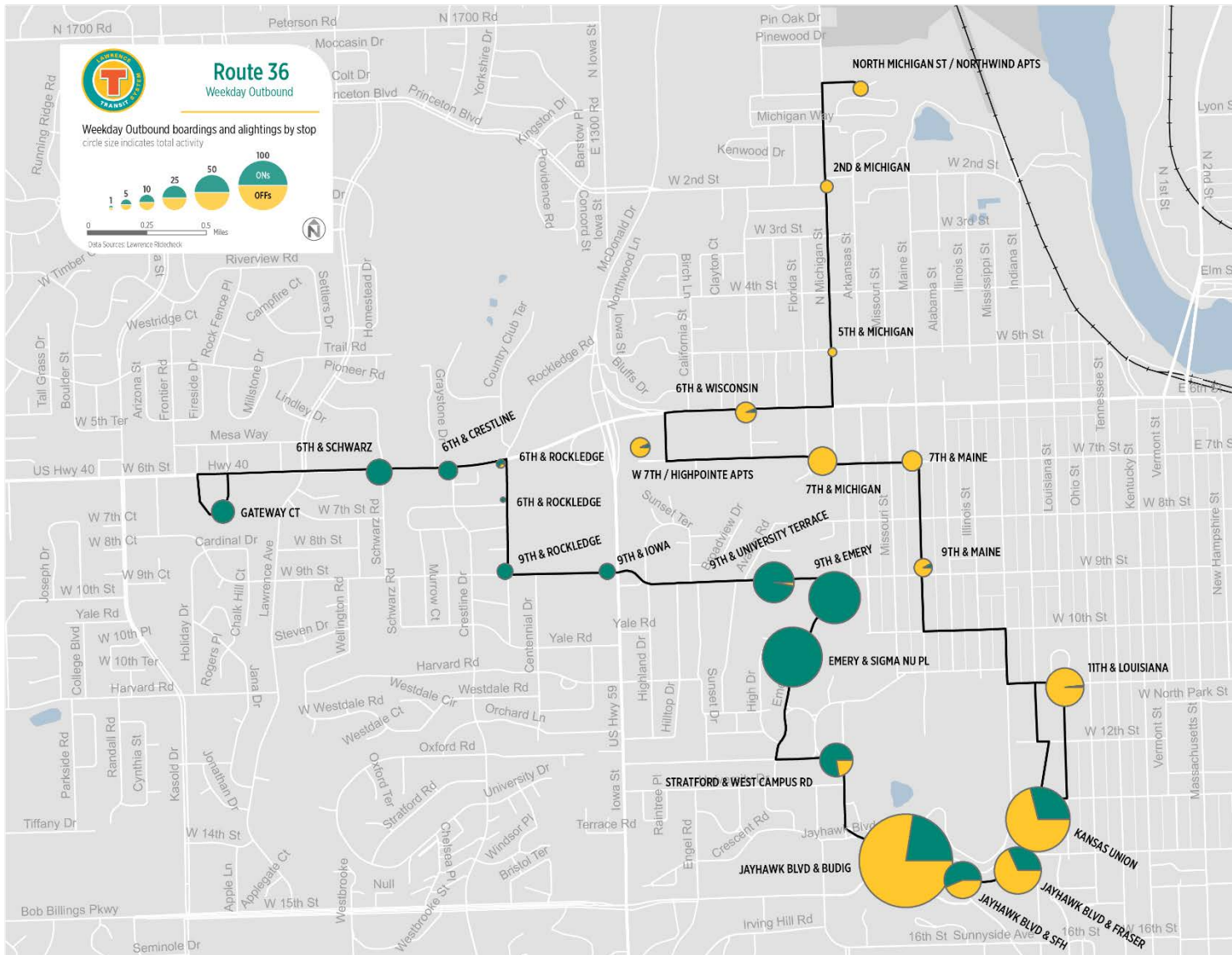
Figure 7 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Snow Hall	132	Snow Hall, KU campus
Bailey Hall	115	Bailey Hall, KU campus
Kansas Union	68	Kansas Union, KU campus
Emery Road / Sigma Nu Place	39	Off-campus residential communities
7th Street / Michigan Street	38	Off-campus residential communities

*Weekday inbound ridership (boardings and alightings) for Route 36 only

ROUTE EVALUATION | ROUTE 36
KU on Wheels

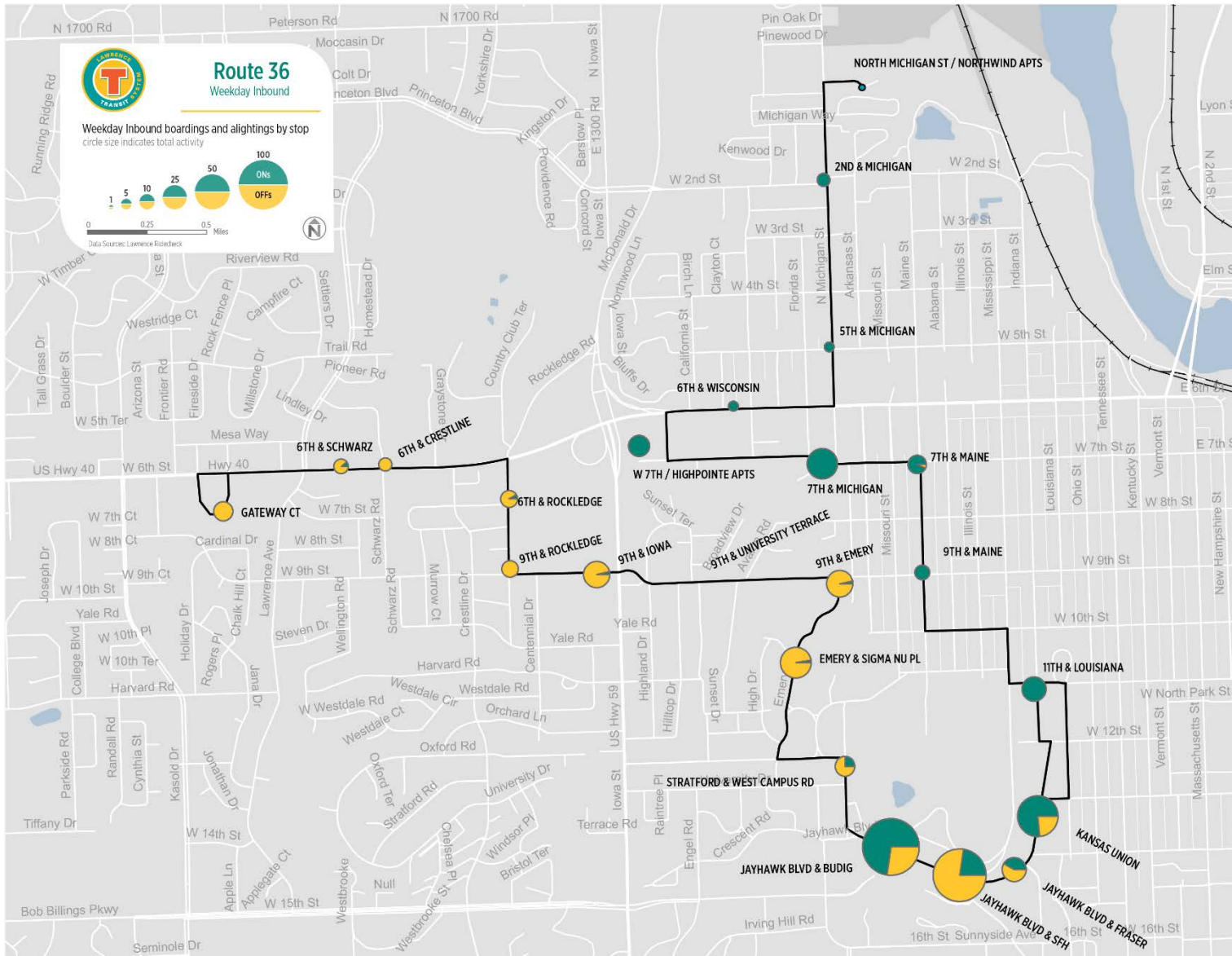
Figure 8 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 36
 KU on Wheels

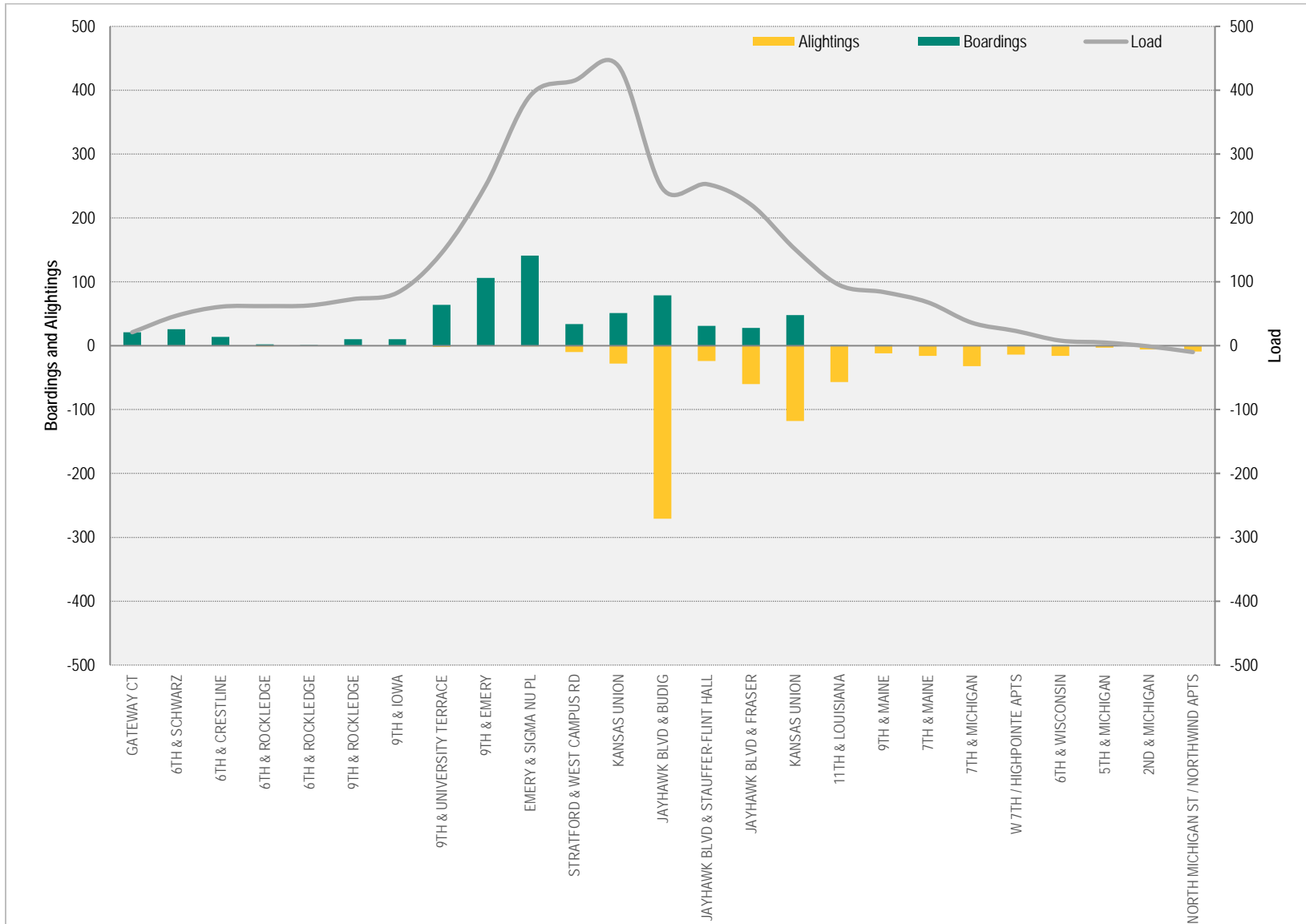
Figure 9 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 36
KU on Wheels

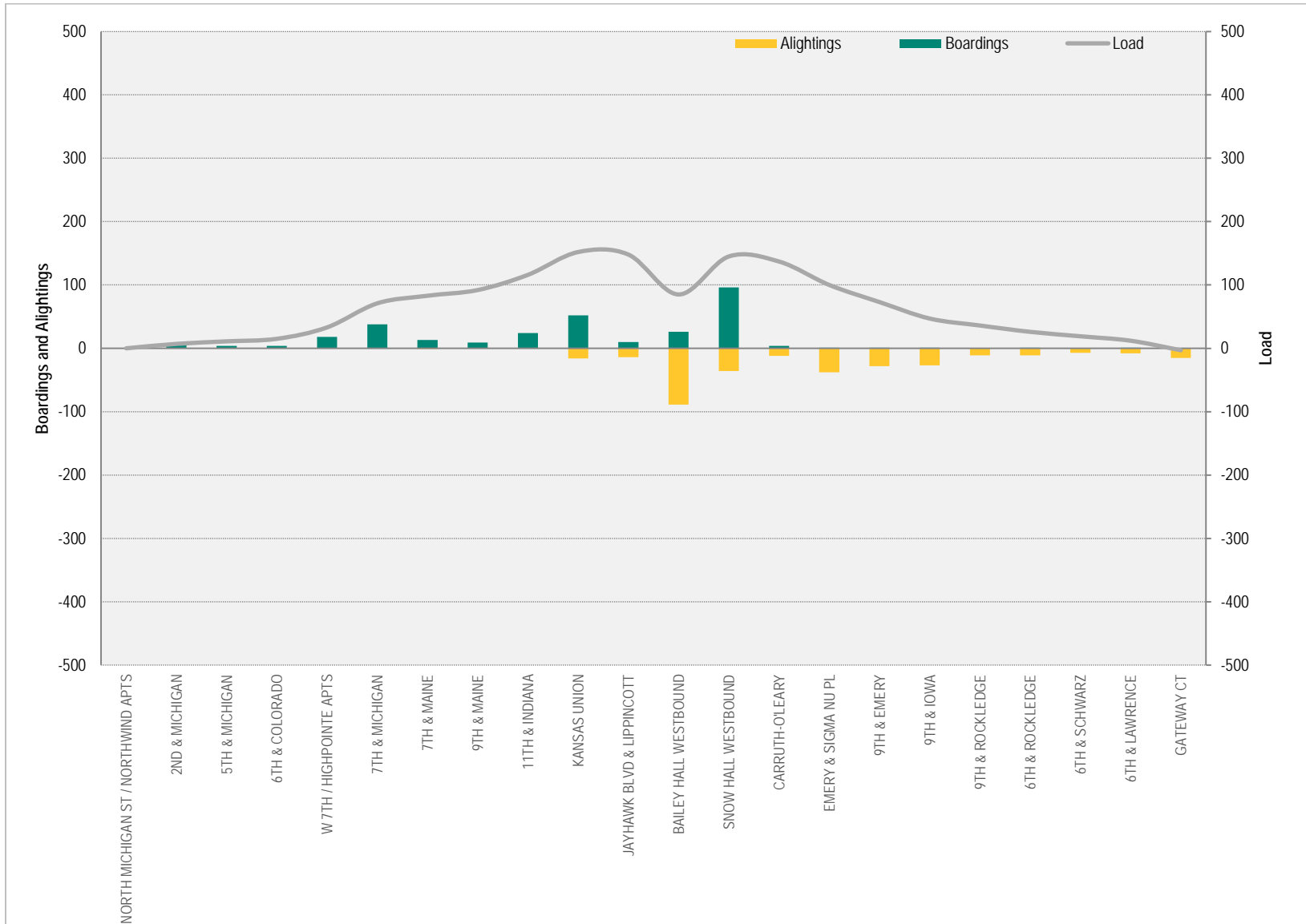
Figure 10 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 36
KU on Wheels

Figure 11 | Weekday Inbound Ridership by Stop Chart



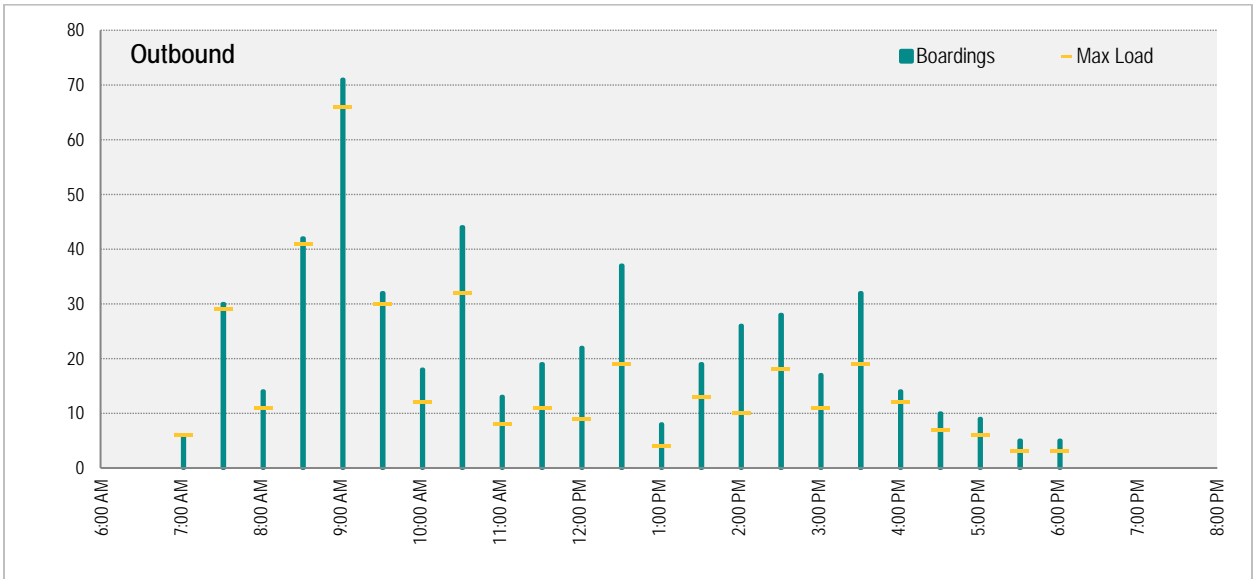
Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

On weekdays, ridership on Route 36 is highest between 7:00 and 11:00 AM (Figure 12 and Figure 13). In the outbound direction, traveling towards campus, ridership is highest from 7:30 and 10:30 AM, when boardings peak at 71 passengers per trip (9:00 AM). In total, seven outbound trips carry 30 passengers or more. Traveling in the inbound direction ridership is more evenly distributed throughout the day: 82% of trips carry 10 passengers or more, but only one trip carries at least 30 passengers (8:50 PM); no trips after 1:30 PM transports more than 20 passengers.

Average passengers per trip is reflective of a route that serves a large population of college students who need to reach classes at a very specific time. Total boardings on several outbound trips exceed seating capacity (35 to 40 passengers); additional service during these periods could help alleviate crush loads.

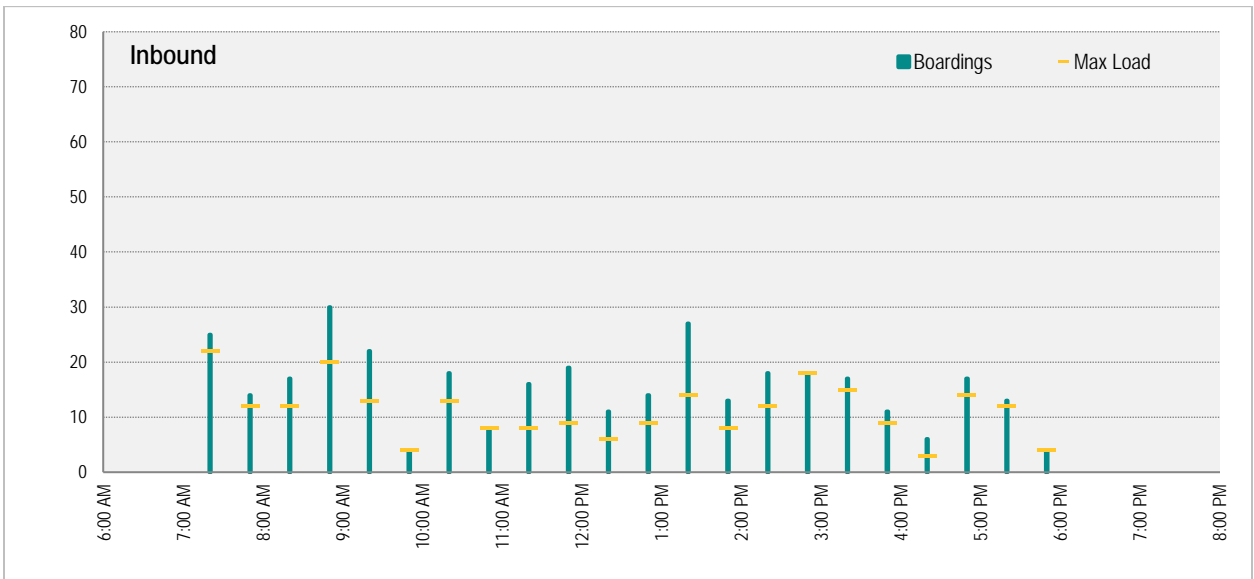
Figure 12 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: No data was collected for the 7:32 AM outbound trip. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 13 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: No data was collected for the 7:20 AM, 11:50 AM, and 1:50 PM outbound trips. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

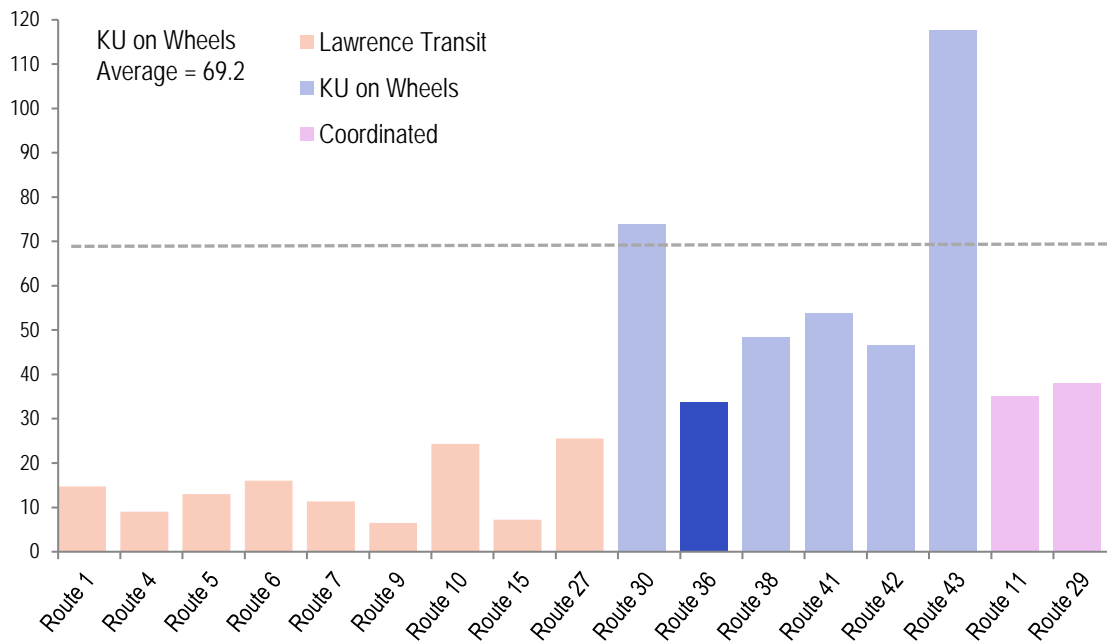
In terms of average passengers per hour, Route 36 is the least productive KU on Wheels bus route (Figure 14). The route carries 33.8 passengers per hour on weekdays, 52% less than the system average (Figure 15).

Figure 14 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	KU ON WHEELS AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	998	29.5	33.8	69.2	6 of 6

Source: Lawrence Transit, 2016

Figure 15 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 47.5% of Route 36 time points were served “on-time” during the survey period (Figure 16). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected primarily by late departures, with 39% of time points served five minutes behind schedule or more.

Figure 16 | On-Time Performance

WEEKDAY	
On-Time	47.5%
Early	13.5%
Late	39%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 36 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Terminate Route at Highpointe Apartments.** Route 36 is most productive in the core campus area, with a majority of ridership occurring along the loop on Jawhawk Drive and Emery Road. These segments include many KU sororities, fraternities, and dormitories. Route 36 becomes much less productive on the north-south and east-west “legs” of the route away from campus. Ridership north of 6th Street is particularly light. Terminating the route at the Highpointe Apartments would improve the route in several important ways. The current route alignment is relatively long, with a round-trip time (not including layover/recovery) of around 63 minutes. This makes scheduling on a 30-minute headway difficult. Shortening the route by removing the north-south leg north of W. 6th Street would allow for more efficient operations, focus the route along the most productive segments, and allow KU on Wheels to reallocate resources elsewhere. This approach would also create a terminal loop along 7th Street, the Highpointe Apartments internal drive, 6th Street, and Maine Street, thus eliminating the unsignalized left turn from 6th Street into the Highpoint Apartments.
- **Operate Service Along Michigan Street, Emery Road, and Jawhawk Boulevard.** A more sweeping redesign to straighten the route and improve performance includes creating a north-south corridor along Michigan Street and Emery Road (with small jogs on W. 7th Street and W. 9th Street to stay on Michigan Street), continuing onto Jawhawk Boulevard, and completing a terminating loop on the current alignment of Louisiana Street. This alignment creates a direct connection between the KU Union, student residential areas around campus, and the residential areas north of W. 6th Street. The KU Union would act as an anchor on the southern end of the route. Timed transfers with routes along W. 6th Street and possibly W. 9th Street would maintain service to additional off-campus residential areas for students.
- **Operate Service Along Maine Street, Jawhawk Boulevard, and Emery Road.** Similarly, a redesign that utilizes Maine Street, Jawhawk Boulevard, and Emery Road would also straighten the route and improve performance. While this option could weaken direct connections between student residential areas as compared to service operated along Michigan Street, connections between residential areas and the campus would remain very strong. This option also creates a direct link between the front doors of Lawrence Memorial Hospital and the KU campus. Timed transfers with routes along W. 6th Street and possibly W. 9th Street would maintain service to additional off-campus residential areas for students.
- **Increase Service Frequency to Every 20 Minutes during Peak Hours.** High ridership per trip during peak hours, with little alighting activity along the route until the final stops, appears to have created overcrowding on a few Route 36 trips. Improving the frequency to every 20 minutes during peak hours would help alleviate this issue and potentially attract new users. At 20-minute headways, riders will have to worry less about missing their bus and carrying or looking up the schedule because the wait time is always relatively short.

KU on Wheels

ROUTE 38

25th & Melrose to KU

SERVICE DESIGN

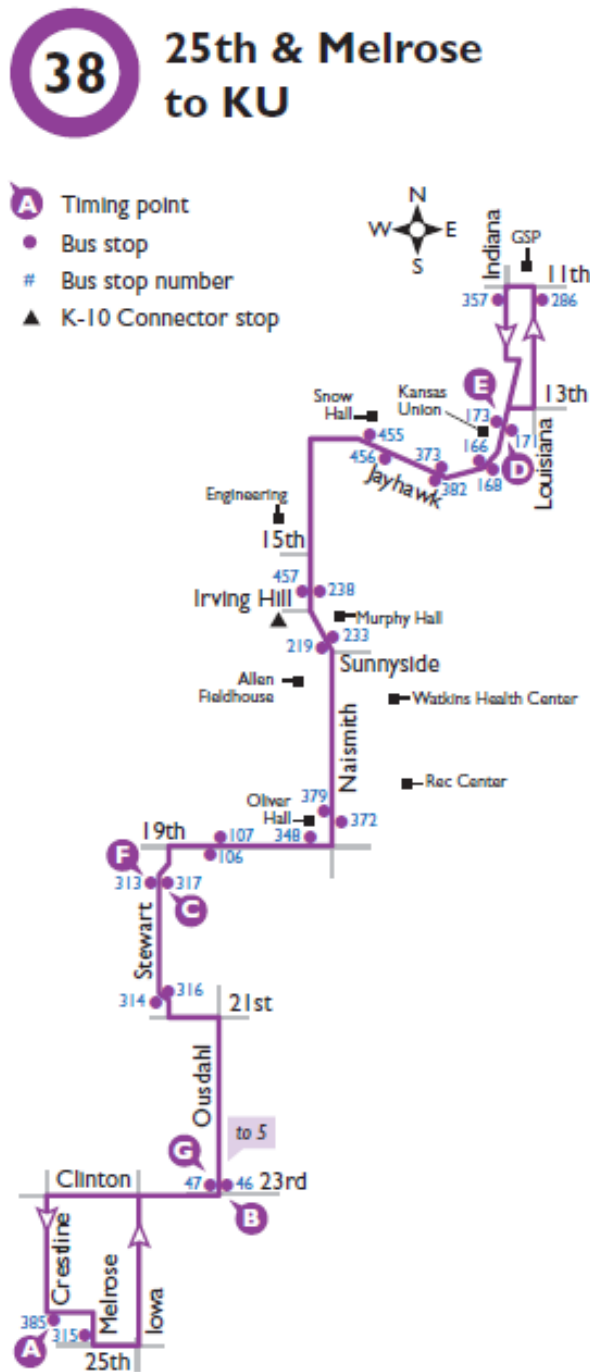
Route 38 is a KU on Wheels route that operates between the Kansas Union and the intersection of 25th Street and Melrose Lane. The route travels primarily along Jayhawk Boulevard, Naismith Drive, 19th Street, Stewart Avenue, Ousdahl Road, and Clinton Parkway (Figure 1). Route 38 connects the KU Main Campus to apartment complexes and shopping centers near the intersection of Clinton Parkway and Iowa Street.

ALIGNMENT/SERVICE PATTERNS

Route 38 has a single consistent service pattern for weekday and Saturday service. Departing outbound from the Kansas Union, Route 38 travels southwest on Jayhawk Boulevard, turns left on Naismith Drive, turns right to continue on Naismith Drive, and then turns right on 19th Street to exit the KU Main Campus. The route then turns left on Stewart Avenue, left on 21st Street, right on Ousdahl Road, right on Clinton Parkway, left on Crestline Drive, and right on Melrose Lane before terminating at the intersection with 25th Street.

Returning inbound, Route 38 turns right on 25th Street, left on Iowa Street, and then right on Clinton Parkway to return to the outbound alignment towards the Kansas Union. After serving the Kansas Union, Route 38 completes a turnaround loop by turning right on 13th Street, left on Louisiana Street, left on 11th Street, left on Indiana Street, left on 12th Street, right on Oread Avenue and then ending service at the Kansas Union.

Figure 1 | Route Map



This route operates Monday–Friday while KU is in session, except holidays and breaks: Martin Luther King Day, Spring Break, Memorial Day, Spring Stop Day, Summer Semester, Labor Day, Fall Break, Thanksgiving Break, Fall Stop Day, and Winter Break.

Source: Lawrence Transit: August 2015 – August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 38 and several Lawrence Transit and KU on Wheels routes at the Kansas Union. There are also transfer opportunities at several other points along the route, including at 23rd Street and Ousdahl Road (Route 5), along 19th Street (Route 11), and along Naismith Drive (Route 27) (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Kansas Union	Route 10, Route 11, Route 29, Route 30, Route 36, Route 43
Snow Hall	Route 10, Route 11, Route 27, Route 29, Route 30, Route 36, Route 41, Route 42, Route 43
23rd Street and Ousdahl Road	Route 5

SERVICE SCHEDULE

Route 38 operates service Monday-Friday when KU is in session (Figure 3). On weekdays, the route runs every 20 to 30 minutes from 7:15 AM to 6:53 PM. Route 38 does not run on Saturdays, Sundays, or when KU is not in session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	7:15 AM – 6:53 PM	20-30	26/26
Saturday	No service	–	–
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 38 ranks last of six KU on Wheels routes in terms of weekday ridership and fifth of six in terms of ridership per trip (Figure 4). On average, the route carries 863 passengers, or 16.6 passengers per trip, on Monday-Friday (Figure 5 and Figure 6).

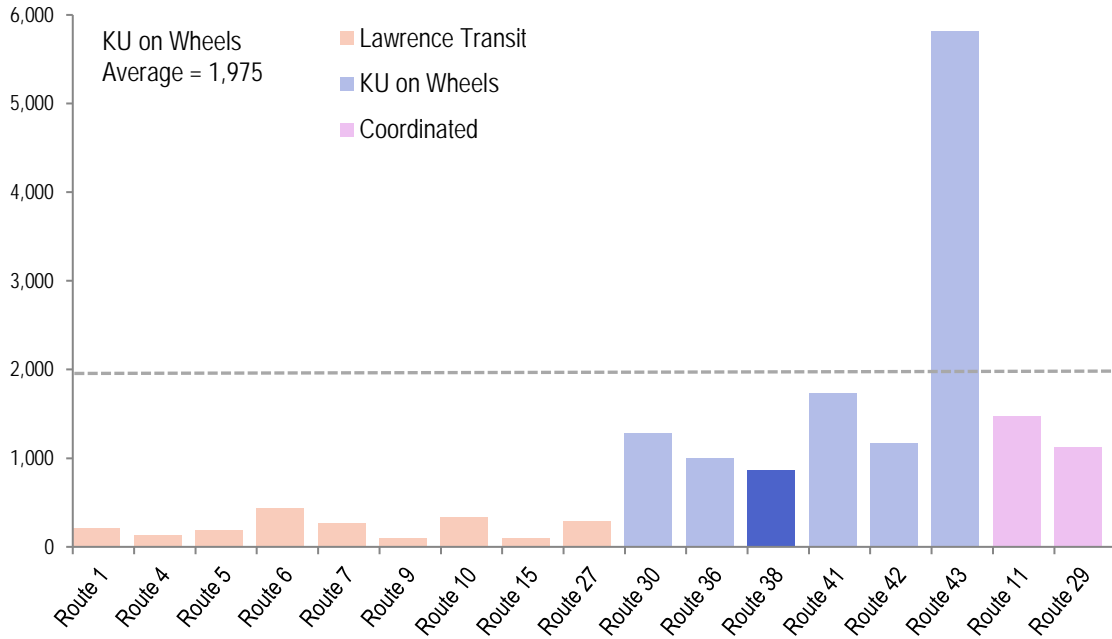
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	KU ON WHEELS AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	863	52	16.6	22.8	5 of 6

Source: Lawrence Transit, 2016

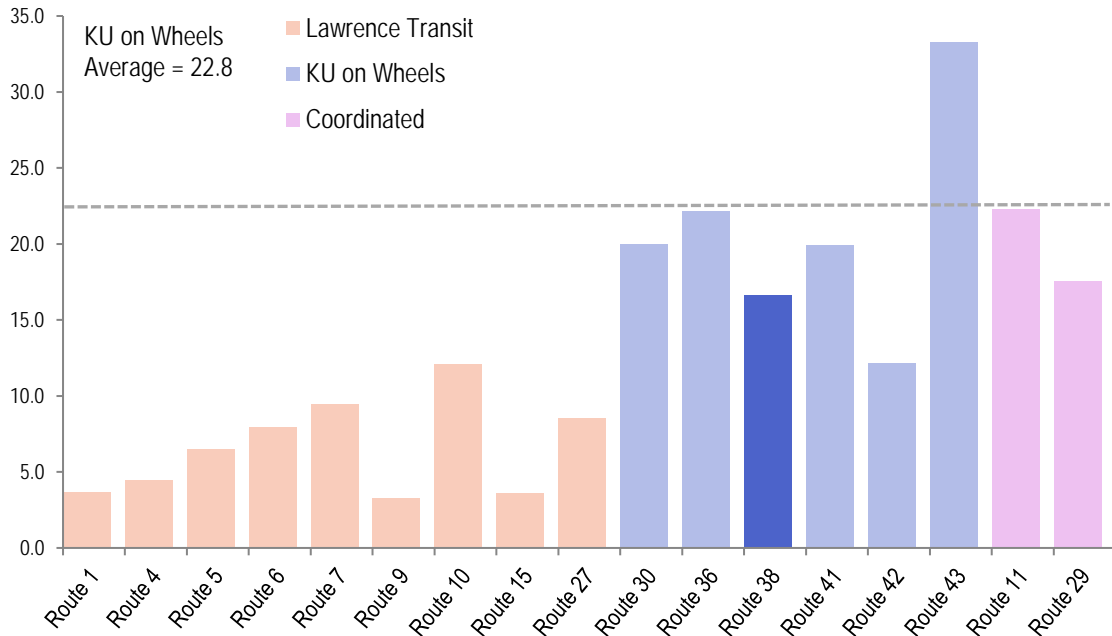
ROUTE EVALUATION | ROUTE 38
 KU on Wheels

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 38 are located on or near KU’s campus, including Budig Hall and the Kansas Union, and off-campus residential communities (Figure 7). The stop at Jayhawk Boulevard and Budig Hall generates an average of 135 daily boardings and alightings. Additionally, stops at the Kansas Union, 25th Street at Melrose Lane, 19th Street at Naismith Street, and Naismith Drive (west of Murphy Hall), each generate over 50 combined riders. All other stops serve fewer than 50 boardings and alightings (Figure 8-Figure 11). The passenger load on inbound trips peaks at Naismith Drive (west of Murphy Hall), at 131 passengers.

Traveling outbound, the following stops feature the highest combined boardings and alightings: the Kansas Union, Bailey Hall, Snow Hall, Naismith Drive at Oliver Hall, and Naismith Drive (west of Murphy Hall). No other outbound stops generate more than 50 combined boardings and alightings.

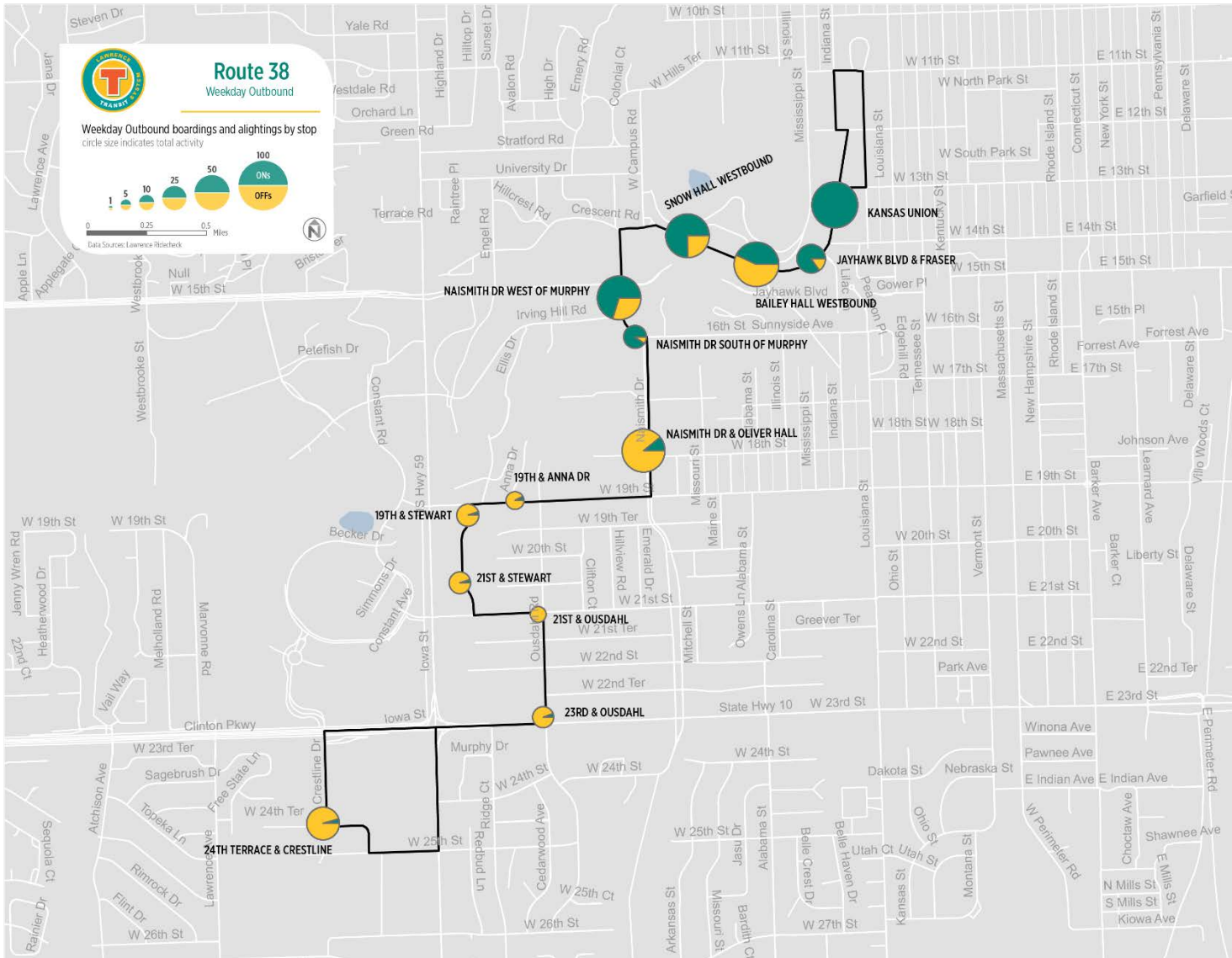
Figure 7 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Jayhawk Boulevard / Budig Hall	135	Budig Hall, KU campus
Kansas Union	102	Kansas Union, KU campus
25th Street / Melrose Lane	82	Off-campus residential communities; Holcom Park Recreation Center; Local retail options
19th Street / Naismith Street	66	Oliver Hall; Naismith Hall; KU campus
Naismith Drive (west of Murphy Hall)	52	Crafton-Preyer Theater; KU campus

*Weekday inbound ridership (boardings and alightings) for Route 38 only

ROUTE EVALUATION | ROUTE 38
 KU on Wheels

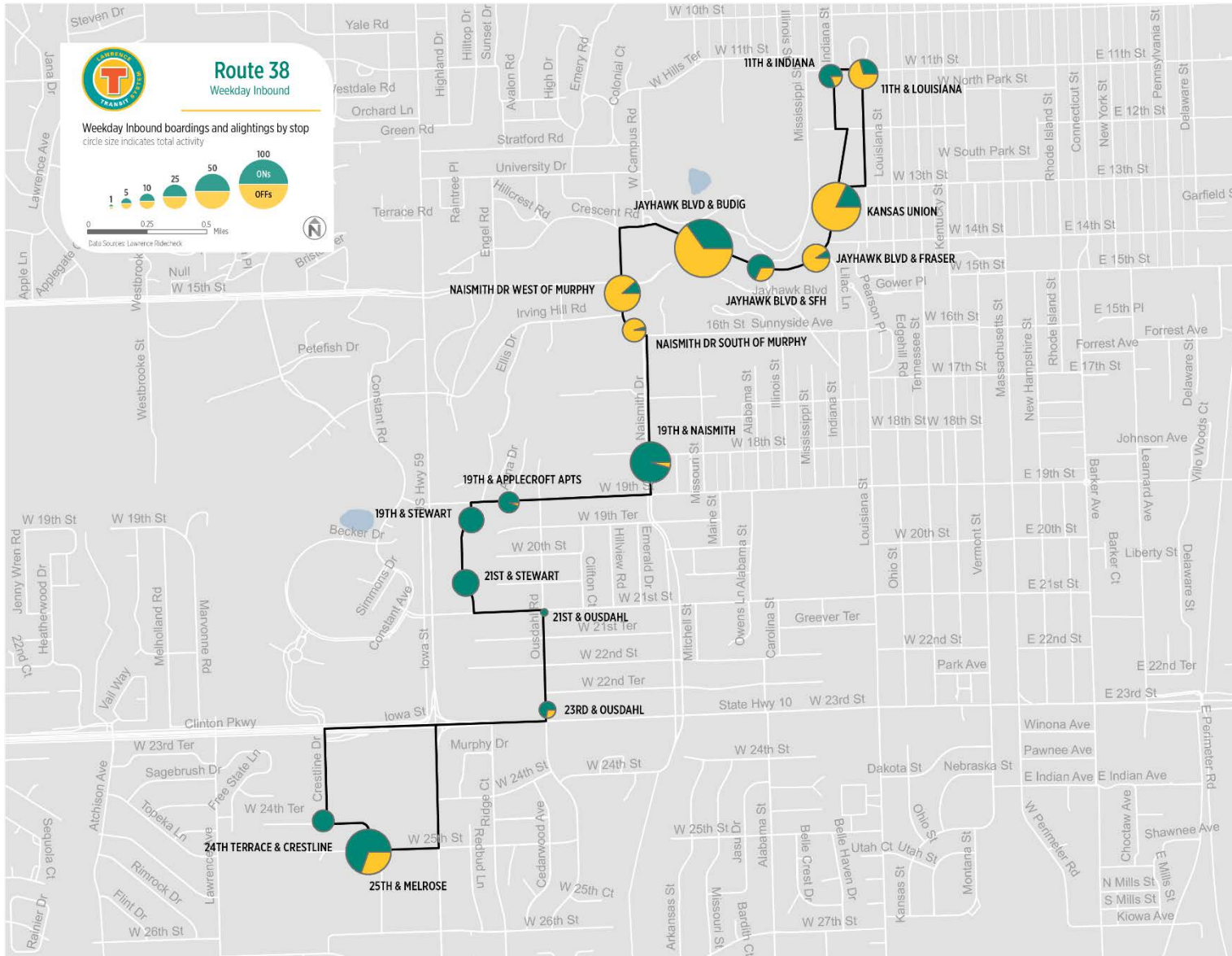
Figure 8 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 38
 KU on Wheels

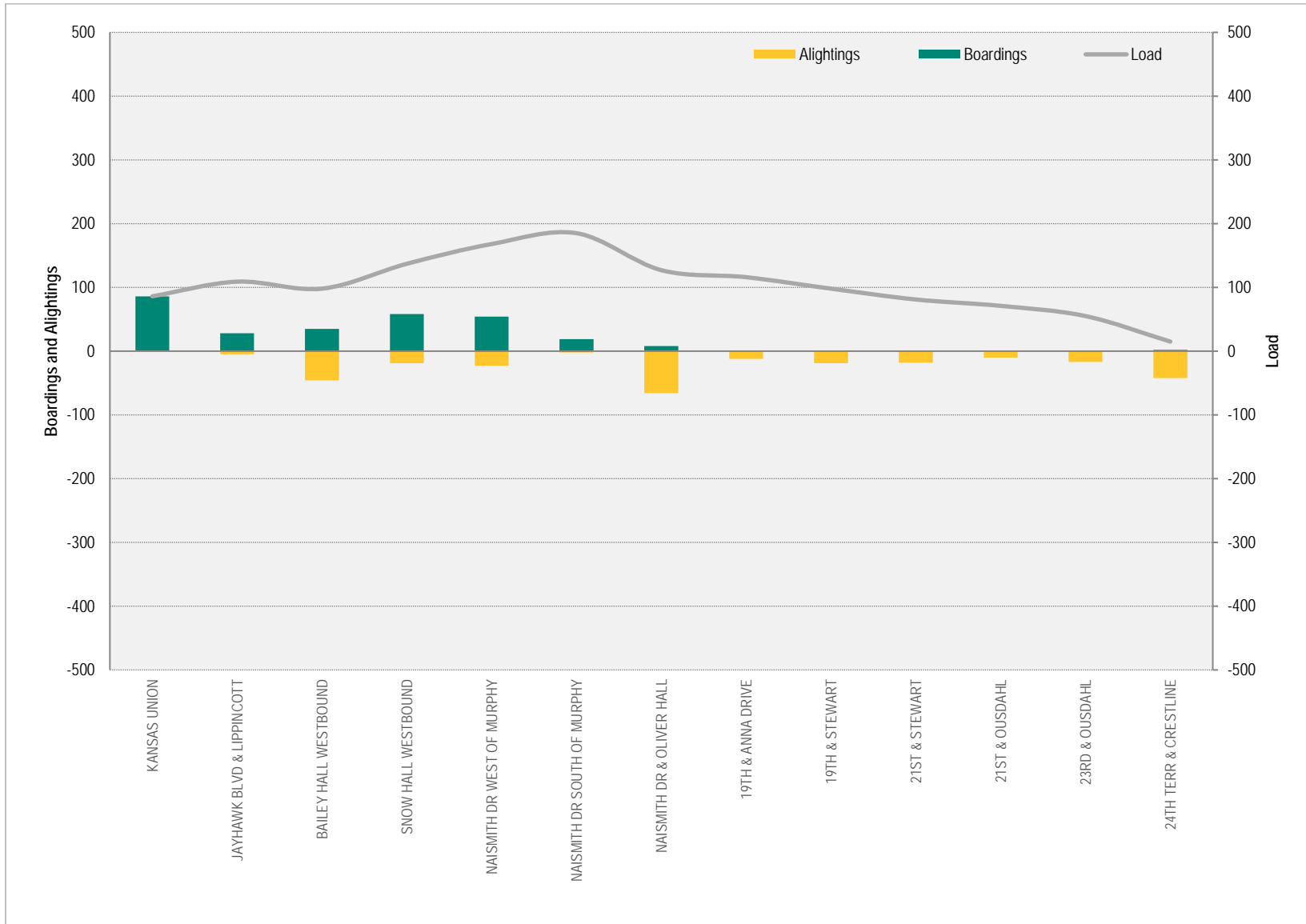
Figure 9 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 38
 KU on Wheels

Figure 10 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 38
 KU on Wheels

Figure 11 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

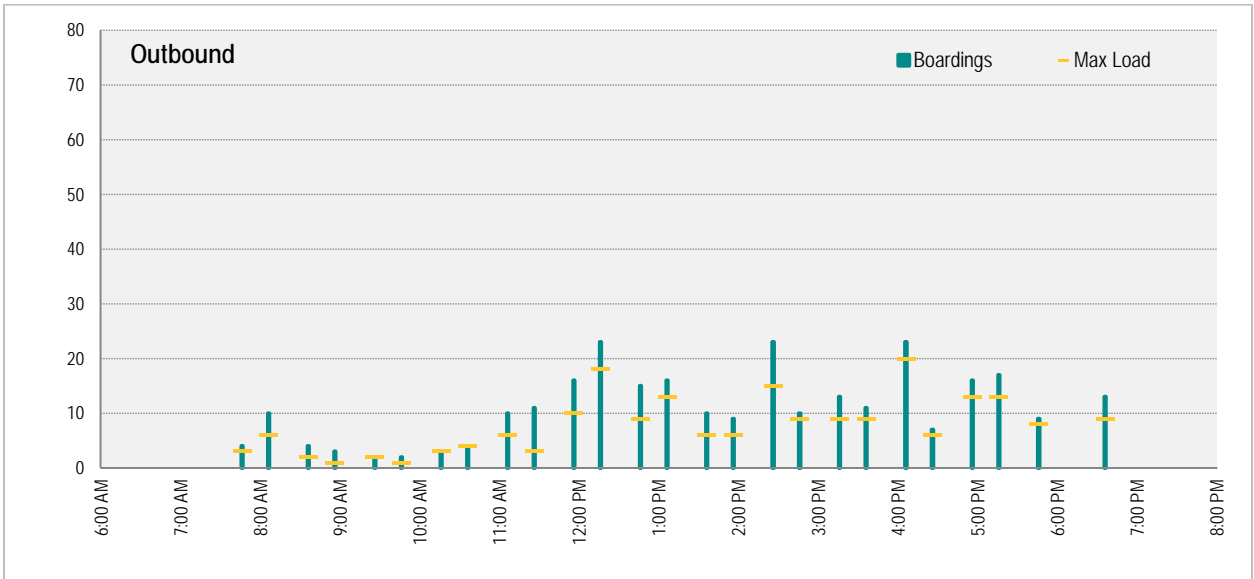
On weekdays, Route 38 ridership is highest during the morning service period traveling in the inbound direction (Figure 12 and Figure 13). Inbound, four trips carry more than 30 passengers, peaking at 10:35 AM (34 passengers); a second ridership spike occurs at 1:55 PM (32 passengers), likely corresponding with students traveling to campus for classes.

Outbound ridership is lighter, with only three trips averaging more than 20 passengers over the course of the service day. This suggests that riders may be using Route 38 interchangeably with other routes, particularly on and near campus, where the route overlaps with several other routes, including Route 27 and Route 42.

Ridership on Route 38 is highest from noon to 6:00 PM, and peaks at 4:06 PM (23 passengers). Outbound ridership is lowest during the morning period, when only four trips carry more than 10 passengers. Passengers per trip does not exceed seating capacity (35 to 40 passengers) on any outbound or inbound trips.

ROUTE EVALUATION | ROUTE 38
 KU on Wheels

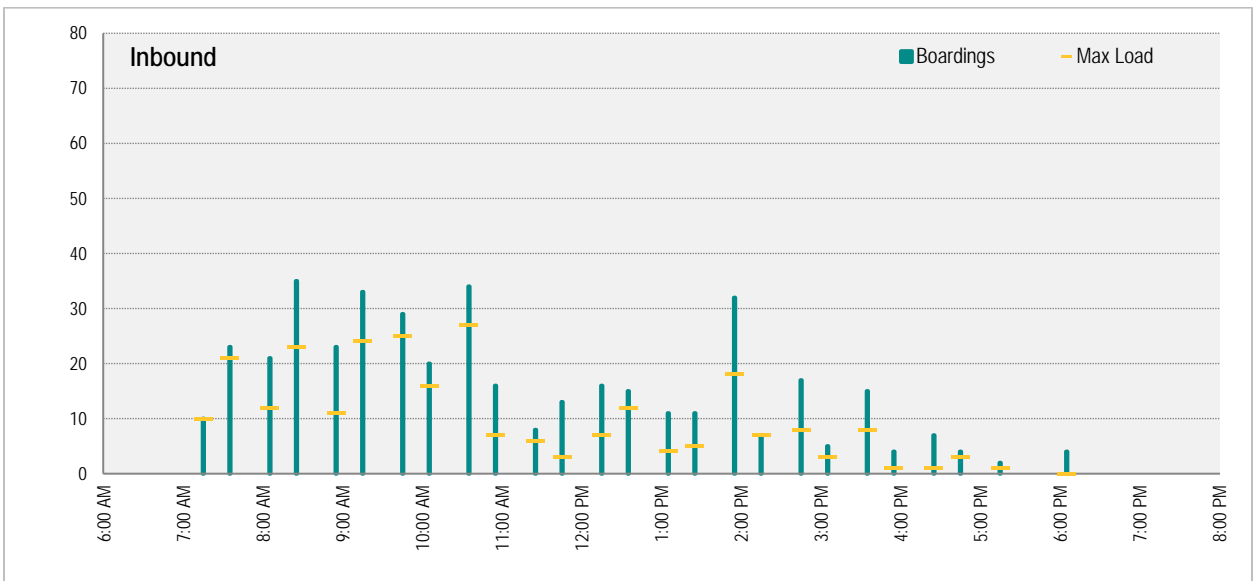
Figure 12 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: No data was collected for the 7:46 AM, 8:06 AM, and 11:56 AM outbound trips. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 13 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

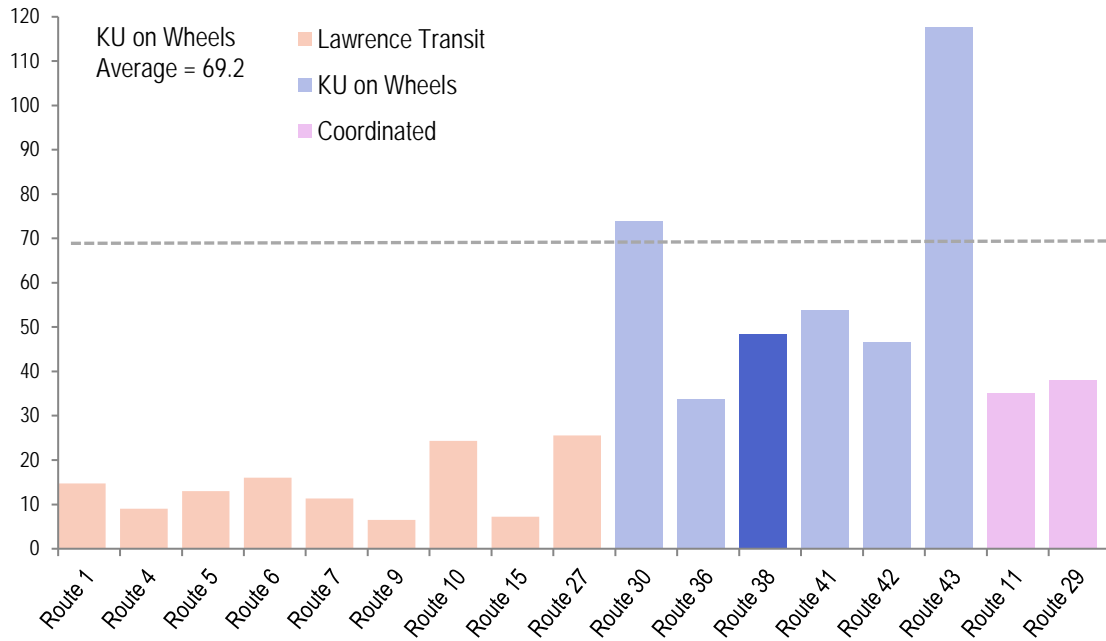
In terms of average passengers per hour, Route 38 is the fourth most productive KU on Wheels bus route (Figure 14). The route carries 48.5 passengers per hour on weekdays, 30% less than the system average (Figure 15).

Figure 14 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	KU ON WHEELS AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	863	17.8	48.5	69.2	4 of 6

Source: Lawrence Transit, 2016

Figure 15 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 66.4% of Route 38 time points were served “on-time” during the survey period (Figure 16). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance is affected by early departures, which account for 24.7% of time points served. Late departures represent only 8.9% of time points served.

Figure 16 | On-Time Performance

WEEKDAY	
On-Time	66.4%
Early	24.7%
Late	8.9%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 38 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Operate on a Consistent 20-minute Headway During Peak Periods.** Currently, Route 38 alternates between a 20-minute and 30-minute headway, creating a somewhat confusing schedule. While the route still primarily serves students, ridership patterns show some similarity to traditional commuter routes because it serves off-campus residential areas that are a 30-45 minute walk to the core campus. Many students are traveling to campus in the morning and staying through at least the lunch hour. A consistent 20-minute frequency during peak hours (approximately 7:30-10:30 AM and 2:30-5:30 PM), and a consistent 30-minute frequency otherwise, would make the route more legible and easier-to-use.
- **Combine with Route 41.** According to on-board surveys, Route 38 ridership is nearly evenly split between students and non-students. This suggests that some riders, particularly south of Clinton Parkway, may be less interested in traveling to the KU campus than riders north of Clinton Parkway. This is further validated by the relatively high rate of transfers between Route 38 and Route 11 serving downtown Lawrence. Combining Route 41 and 38 would create a loop linking the West Campus with the Main Campus via 19th Street and Irving Hill Road (assuming buses operate bi-directionally). Neighborhoods south of Clinton Parkway could then be more directly linked to downtown Lawrence, perhaps with a modification to Route 7.
- **Consider Interlining Route 38 with Another KU on Wheels Route.** Route 38 is a relatively short route that completes a full round-trip including layover time in about 50 minutes. Interlining Route 38 with another KU on Wheels route could facilitate more efficient operations and creating one seat ride opportunities. Interlining Route 38 with another route could also help improve its on-time performance by optimizing cycle time and recovery time.

KU on Wheels

ROUTE 41

Campus Circulator (Yellow)

SERVICE DESIGN

Route 41 is a KU on Wheels circulator route that operates service on the campus of the University of Kansas. The route travels primarily along Jayhawk Boulevard, Irving Hill Road, Becker Drive, and Sunnyside Avenue (Figure 1). Route 41 provides service to numerous on-campus destinations, including academic buildings, residence halls, and recreation facilities.

ALIGNMENT/SERVICE PATTERNS

Route 41 has a single consistent service pattern for weekday service. Departing outbound from the Park and Ride Stop #4 on Becker Drive, Route 41 starts on Becker Drive, turns right on Constant Avenue, right on Irving Hill Road, right on Naismith Drive, and continues to Sunnyside Avenue. From Sunnyside Avenue, Route 41 turns left on Sunflower Road and left on Jayhawk Boulevard, serving Bailey Hall before terminating at Snow Hall.

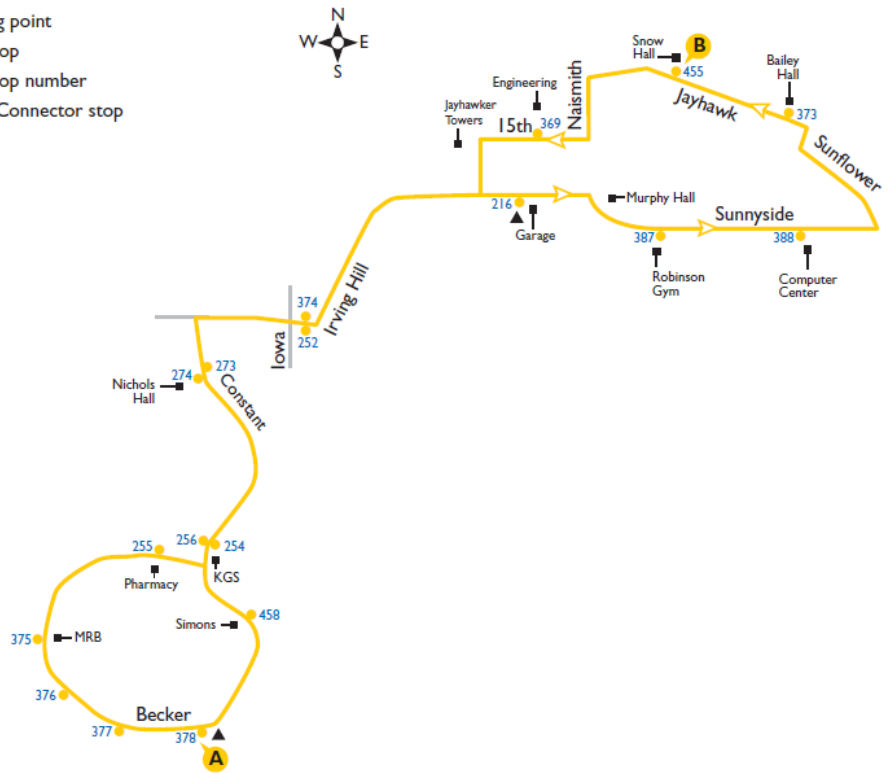
Returning inbound from Snow Hall, Route 41 begins on Jayhawk Boulevard, travels around the traffic circle onto Crescent Road, turns left on Naismith Drive, right on 15th Street, and left on Burdick Road. From Burdick Road Route 41 turns right on Irving Hill Road, left on Constant Avenue, and right on Becker Drive, terminating at the Park and Ride Stop #4.

ROUTE EVALUATION | ROUTE 41
KU on Wheels

Figure 1 | Route Map

41 Campus Circulator
(Yellow)

- A** Timing point
- Bus stop
- # Bus stop number
- ▲ K-10 Connector stop



This route operates Monday–Friday while KU is in session, except holidays and breaks: Martin Luther King Day, Spring Break, Memorial Day, Spring Stop Day, Summer Semester, Labor Day, Fall Break, Thanksgiving Break, Fall Stop Day, and Winter Break.

Source: Lawrence Transit; August 2015 – August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 41 and several Lawrence Transit and KU on Wheels routes at the Snow Hall. There are also transfer opportunities at several other points along the route, including along Irving Hill Road (Route 11); transfers to the K-10 Connector, operated by Johnson County Transit, are also available on Irving Hill Road (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Snow Hall	Route 10, Route 11, Route 27, Route 29, Route 30, Route 36, Route 38, Route 42, Route 43
Irving Hill Road and Engel Road	Route 11, Route 43

SERVICE SCHEDULE

Route 41 operates service Monday-Friday when KU is in session (Figure 3). On Monday–Thursday, the route runs every eight to 30 minutes from 6:30 AM to 10:30 PM during KU’s fall and spring semesters. On Fridays during KU’s fall and spring semesters Route 41 runs every eight to 20 minutes from 6:30 AM to 7:00 PM. During the summer session, or when KU is on break, Route 41 runs every 30 minutes from 6:30 AM to 6:30 PM. Route 41 does not operate on Saturdays or Sundays.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Thursday	6:30 AM – 10:30 PM	8-30	--
Friday	6:30 AM – 7:00 PM	8-20	--
Monday-Friday (KU on break)	6:30 AM – 6:30 PM	30	--
Saturday-Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 41 ranks second of six KU on Wheels routes in terms of weekday ridership and fourth of six in terms of ridership per trip (Figure 4). On average, the route carries 1,730 passengers, or 19.9 passengers per trip, on Monday-Friday (Figure 5 and Figure 6).

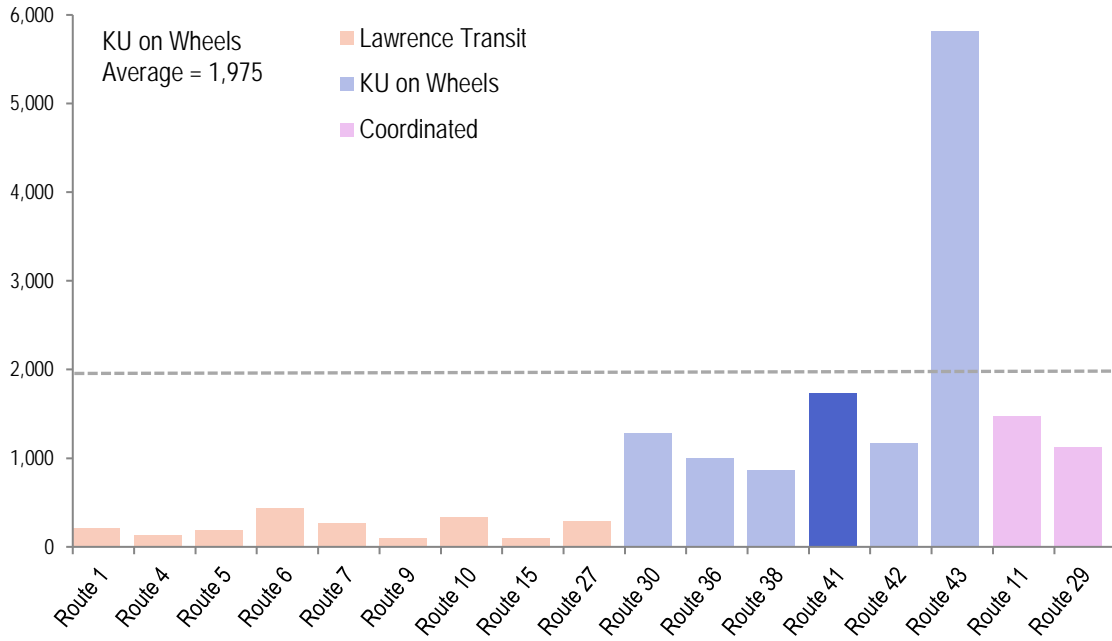
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TYPICAL DAILY TRIPS	AVERAGE RIDERSHIP PER TRIP	KU ON WHEELS AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	1,730	87	19.9	22.8	4 of 6

Source: Lawrence Transit, 2016

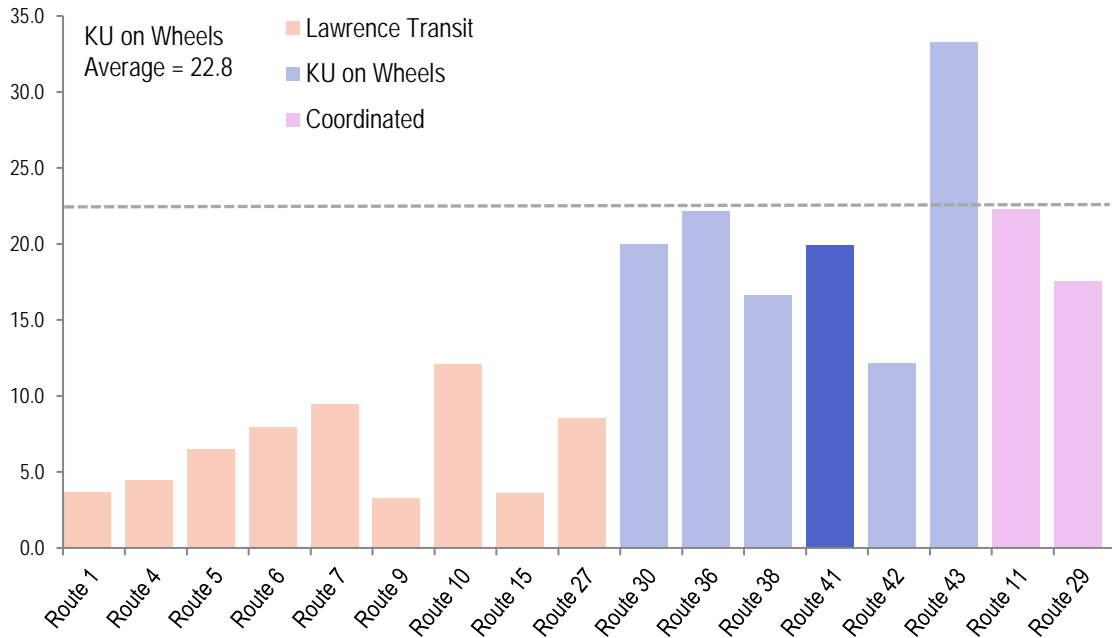
ROUTE EVALUATION | ROUTE 41
 KU on Wheels

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday ridership stops on Route 41 are located on KU’s campus, near academic buildings and on-campus student housing (Figure 7). The highest ridership stop is at Irving Hill Road and Engel Road West, which generates an average of 475 daily boardings and alightings. Other stops with more than 100 boardings and alightings per weekday include: Snow Hall Westbound, Bailey Hall Westbound, Robinson Gym, Irving Hill Road and Engel Road East, and Becker Drive Stop #4. These stops primarily serve academic buildings, including Snow Hall, Bailey Hall, and Oswald Hall, on-campus student housing, and commuter parking lots. All other stops serve fewer than 87 boardings and alightings (Figure 8-Figure 9).

Figure 7 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday)

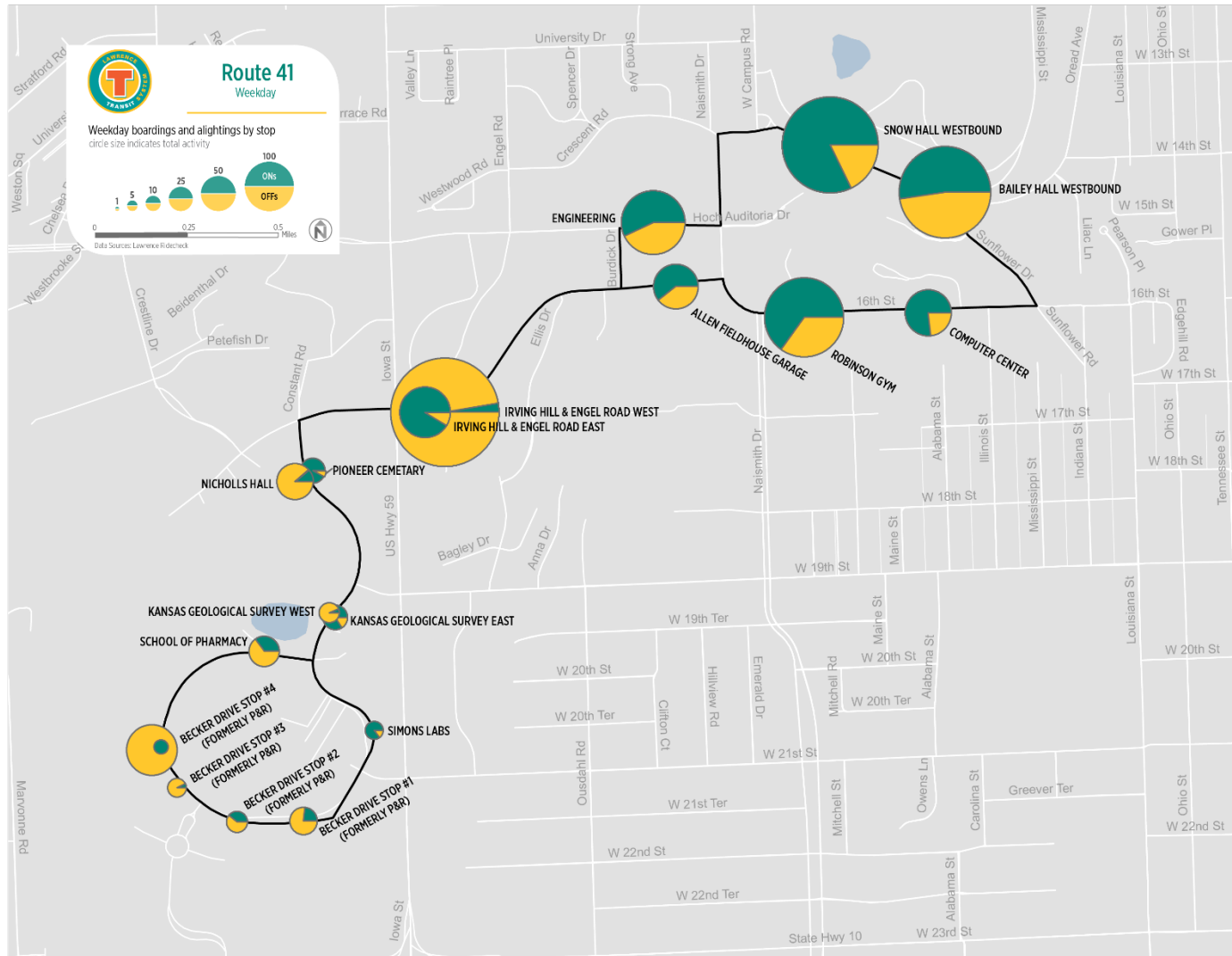
BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Irving Hill Road / Engel Road West	475	Oswald Hall; on-campus student housing; Lied Center of Kansas
Snow Hall Westbound	371	Snow Hall, KU campus
Bailey Hall Westbound	338	Bailey Hall, KU campus
Robinson Gym	252	Allen Fieldhouse, School of Business, KU campus
Becker Drive Stop #4	112	Commuter parking; Multidisciplinary Research Building

*Weekday ridership (boardings and alightings) for Route 41 only

ROUTE EVALUATION | ROUTE 41

KU on Wheels

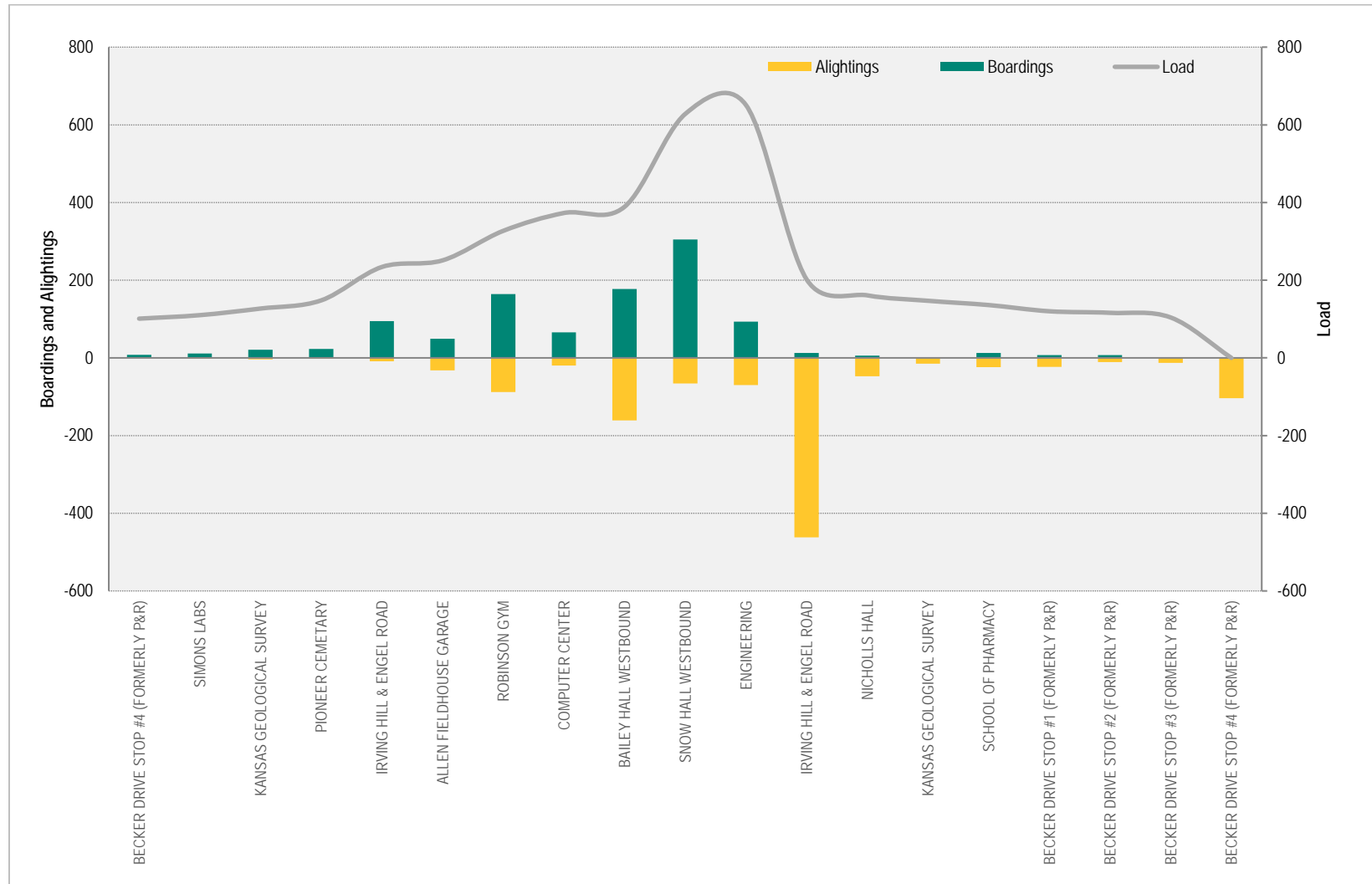
Figure 8 | Weekday Loop Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 41
 KU on Wheels

Figure 9 | Weekday Loop Ridership by Stop Chart

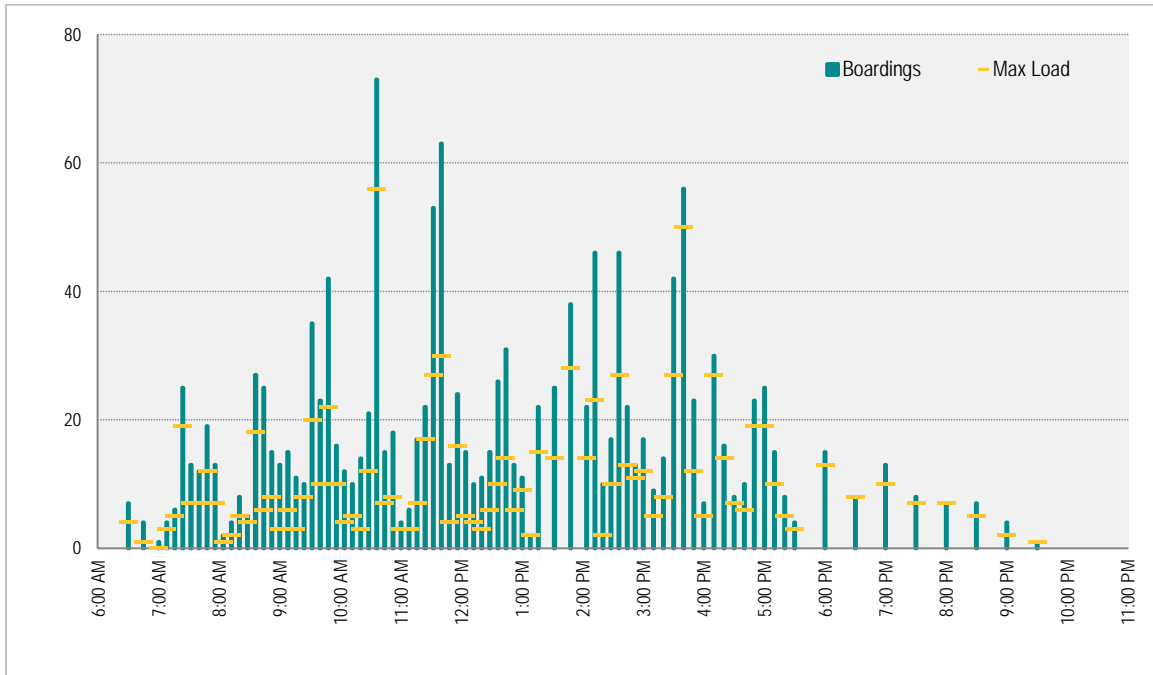


Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

Weekday ridership trends are cyclical, and likely align with KU's class schedule. On weekdays, Route 41 ridership is highest during the mid-morning and afternoon service periods (Figure 10). During these periods ridership regularly exceeds 40 passengers per trip. Ridership peaks at 10:36 AM, averaging 73 passengers per trip. Secondary peaks occur at 11:32 AM (53 passengers), 11:40 AM (63 passengers), and 3:40 PM (56 passengers). Overall, 33% of all trips carry 20 or more passengers, and 10% of all trips carry over 40 passengers. Ridership declines during the evening service period; no trips after 5:00 PM average more than 15 passengers.

Figure 10 | Weekday Loop Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: No data recorded for the 1:24, 1:40, or 1:56 PM trips. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

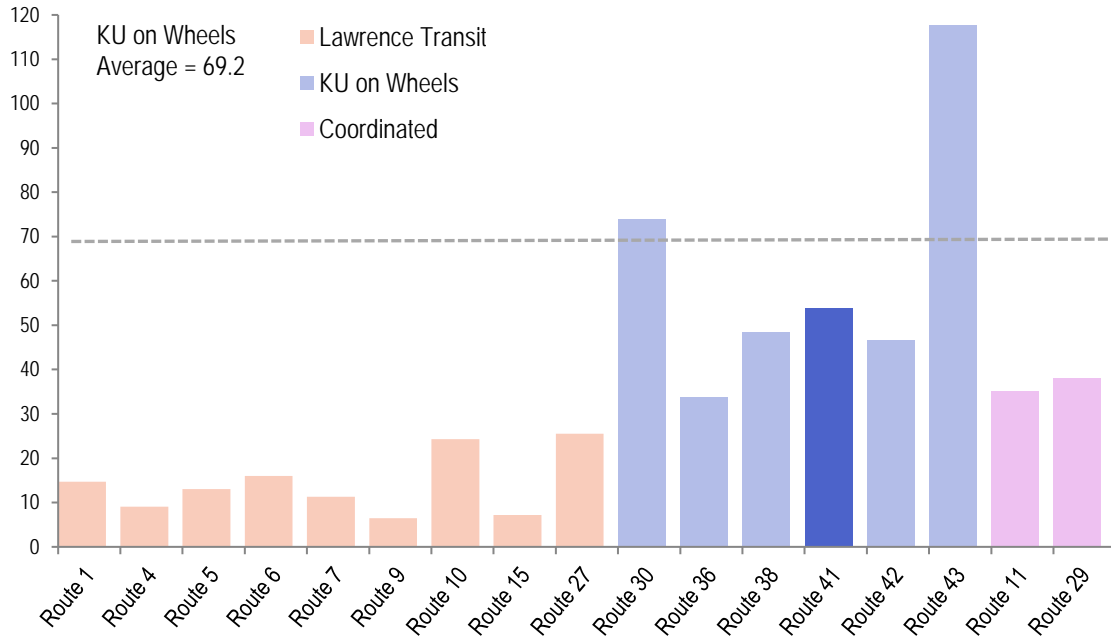
In terms of average passengers per hour, Route 41 is the third most productive KU on Wheels bus route (Figure 11). The route carries 53.9 passengers per hour on weekdays, 23% less than the system average (Figure 12).

Figure 11 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	KU ON WHEELS AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	1,730	32.1	53.9	69.2	3 of 6

Source: Lawrence Transit, 2016

Figure 12 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 31.5% of Route 41 time points were served “on-time” during the survey period (Figure 13). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected equally by early and late departures: 37.5% of time points were served early, while 31% of time points were impacted by late departures.

Figure 13 | On-Time Performance

WEEKDAY	
On-Time	31.5%
Early	37.5%
Late	31.0%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 41 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Combine with Route 38.** Overall, Route 41 is a productive, high-ridership route that connects students to computer labs, recreational centers, housing, classrooms, and research labs. Potential opportunities exist, though, to make additional connections to off-campus housing and retail locations. Combining Route 38 and 41 would create a loop linking West Campus with the Main Campus via 19th Street and Irving Hill Road (assuming buses operate bi-directionally), as well as neighborhoods to the south and east of campus.
- **Shift 8-Minute Frequency to Between 9:00 AM and 5:00 PM.** Route 41 has minor overcrowding issues at various times of day, including between 3:00 and 4:00 PM. Currently, the bus runs every eight minutes from 7:00 AM to 3:00 PM, and every ten minutes from 3:00 PM to 5:30 PM. Ridership on Route 41 peaks between 9:00 AM and 5:00 PM, so running the bus more frequently during this period could help the afternoon overcrowding.
- **Simplify Schedule Headways.** The current schedule has four different headways on Route 41 depending on the time of day. Though all but the evening headway of 30-minutes are short enough that riders do not need to look at or remember a schedule at all, a simpler schedule would make the service even easier to use and could potentially spur ridership after 6:00 PM. For example, a headway of every 20 minutes from 6:30 AM – 9:00 AM, every 8 minutes from 9:00 AM – 5:00 PM, and every 20 minutes again from 5:00 PM – 10:30 PM would maintain the current number of daily trips on the route but make the schedule much easier to remember.
- **End Service at 8:00 PM.** Evening service on Route 41 tends to be unproductive, and after approximately 9:30 PM, the route has no riders. Ending service around 8:00 PM makes resources available to devote elsewhere on the system and makes the schedule more consistent with other routes in the system.
- **Add Saturday Service on Route 41.** Ridership is strong during the weekday on Route 41, indicating that additional weekend service could also be successful. Route 41 is also a short trip for students and makes many advantageous connections on campus; Saturday service would benefit students, especially in inclement weather and during exam times.

KU on Wheels

ROUTE 42

Campus Circulator (Blue/Orange)

SERVICE DESIGN

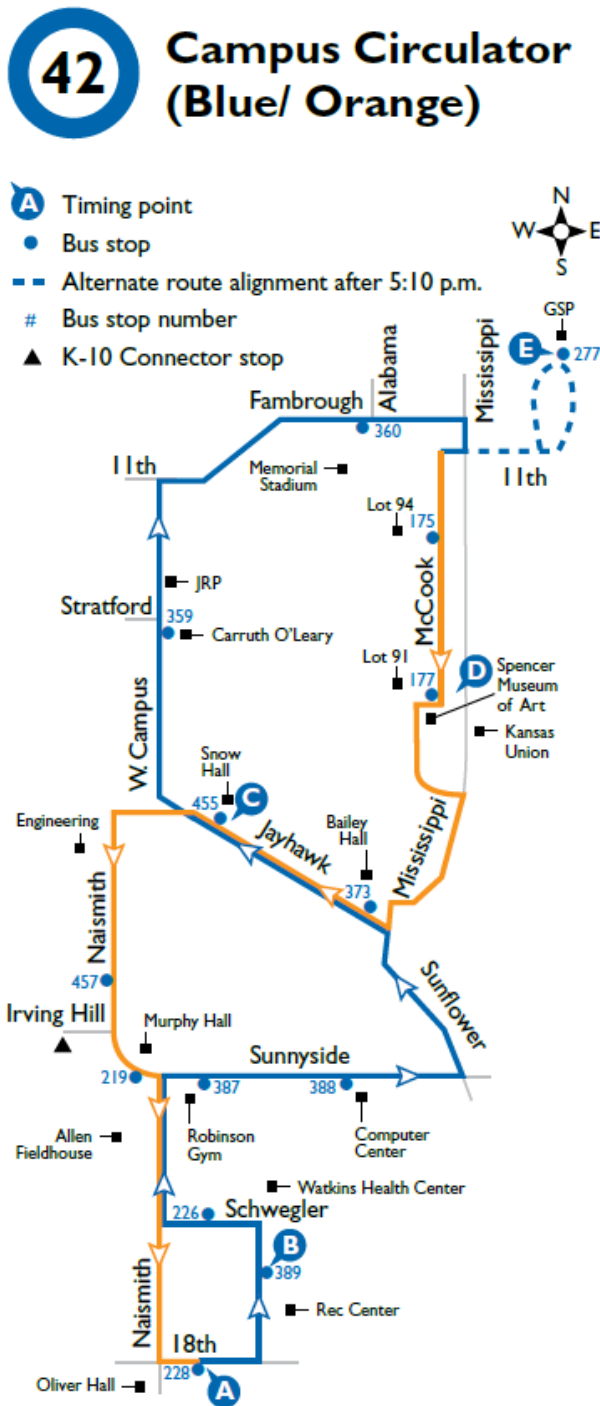
Route 42 is a KU on Wheels circulator route that operates two service alignments on the campus of the University of Kansas. The route travels primarily along Naismith Drive, Sunnyside Avenue, W. Campus Road, McCook Street, Mississippi Street, and Jayhawk Boulevard (Figure 1). Route 42 provides service to numerous on-campus destinations, including academic buildings, residence halls, recreation facilities, Memorial Stadium, and Spencer Museum of Art.

ALIGNMENT/SERVICE PATTERNS

Route 42 operates two distinct service patterns for inbound and outbound weekday service, with an alternate inbound route alignment extending service to the Gertrude Sellards Pearson (GSP) Residence Hall from 5:10 p.m. to 10:25 p.m., when service concludes. Departing inbound from the bus stop at 18th Street and Naismith Drive, Route 42 turns left at Watkins Center Drive, serving the KU Student Center. The route turns left on Schwegler Drive, right on Naismith Drive, right on Sunnyside Avenue, left on Sunflower Road, and follows Jayhawk Boulevard through main campus, before turning right on W. Campus Road. From W. Campus Road Route 42 turns right on 11th Street, right on Mississippi Street, and terminates service at Lot 94. From 5:10 p.m. to 10:25 p.m., Route 42 turns left on 11th Street, right on College Drive, serves the GSP, turns right back onto 11th Street, and terminates at Lot 94.

Traveling outbound from Lot 94, Route 42 serves the Spencer Museum of Art, turns right on Mississippi Street, left on Sunflower Road, and right on Jayhawk Boulevard. From Jayhawk Boulevard Route 42 travels around the traffic circle onto Crescent Road, turns left on Naismith Drive and follows Naismith until turning left on 18th Street and completing the route.

Figure 1 | Route Map



This route operates Monday–Friday while KU is in session, except holidays and breaks: Martin Luther King Day, Spring Break, Memorial Day, Spring Stop Day, Summer Semester, Labor Day, Fall Break, Thanksgiving Break, Fall Stop Day, and Winter Break.

Source: Lawrence Transit; August 2015 – August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 42 and several Lawrence Transit and KU on Wheels routes at the Snow Hall. There are also transfer opportunities at several other points along the route, including along Sunnyside Drive (Route 27 and Route 41), Jayhawk Boulevard, and Naismith Drive (Route 11, Route 27, Route 38); transfers to the K-10 Connector, operated by Johnson County Transit, are also available on nearby Irving Hill Road (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Snow Hall	Route 10, Route 11, Route 27, Route 29, Route 30, Route 36, Route 38, Route 41, Route 43

SERVICE SCHEDULE

Route 42 operates service Monday-Friday when KU is in session (Figure 3). On Monday-Thursday, the route runs every 15 to 30 minutes from 7:10 AM to 10:26 PM. On Fridays, Route 42 runs every 15 minutes from 7:10 AM to 5:55 PM. Route 42 does not operate on Saturdays or Sundays, or when KU is not in session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Thursday	7:10 AM – 10:26 PM	15-30	52/53
Friday	7:10 AM – 6:00 PM	15	42/43
Saturday	No service	–	–
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 42 ranks fourth of six KU on Wheels routes in terms of weekday ridership and last of six in terms of ridership per trip (Figure 4). On average, the route carries 1,166 passengers, or 12.1 passengers per trip, on Monday-Friday (Figure 5 and Figure 6).

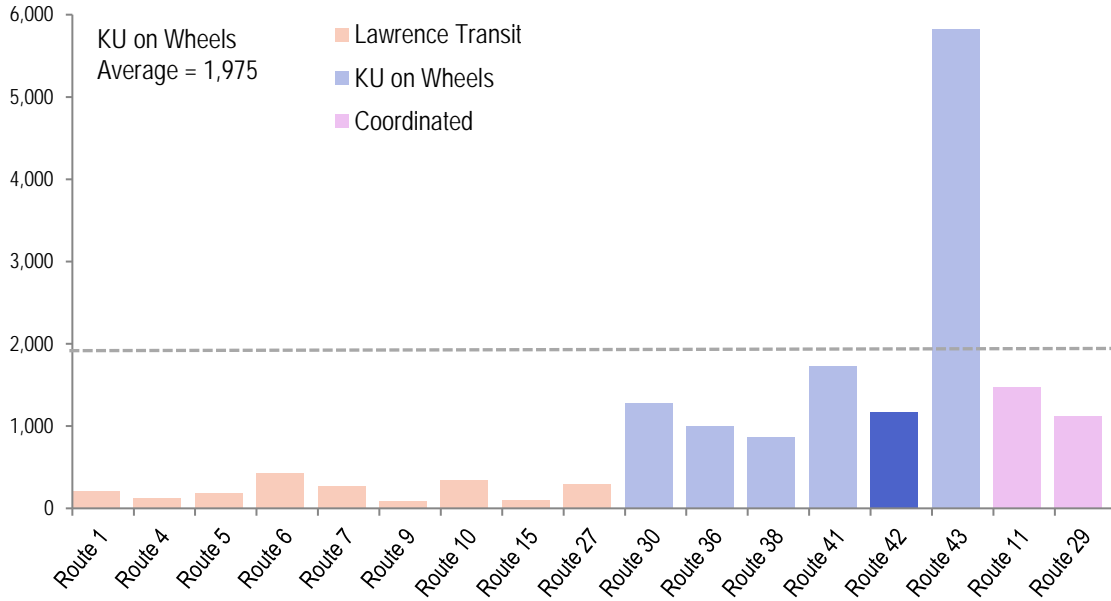
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	KU ON WHEELS AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday-Friday	1,166	96	12.1	22.8	6 of 6

Source: Lawrence Transit, 2016

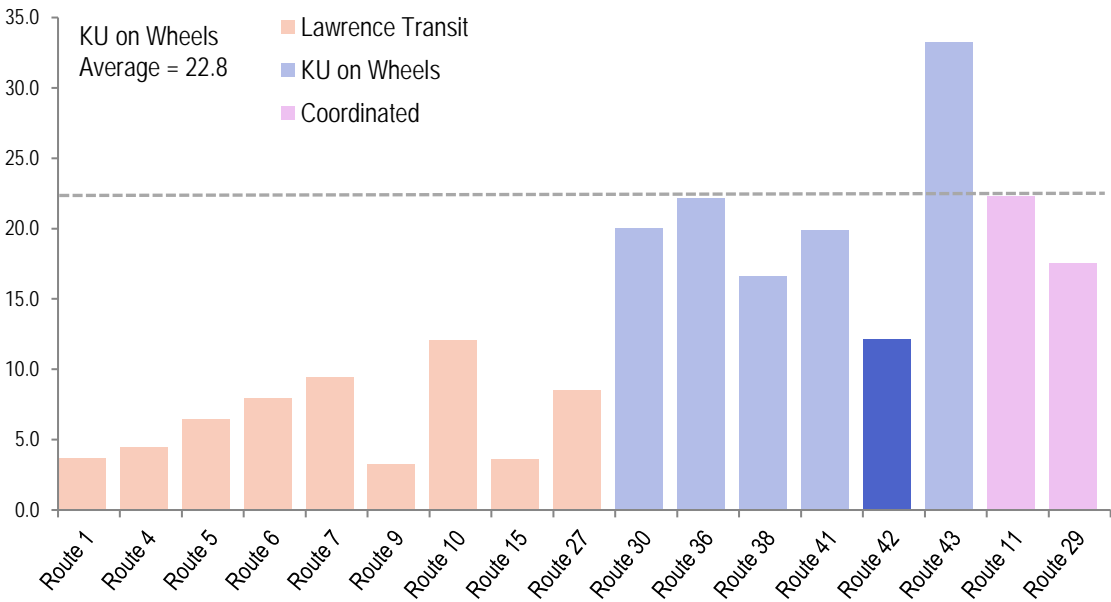
ROUTE EVALUATION | ROUTE 42
 KU on Wheels

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest weekday inbound ridership stops on Route 42 are located on KU’s campus near academic buildings and recreational facilities (Figure 7). Ridership is highest at Bailey Hall Westbound, averaging 428 combined daily boardings and alightings. Other stops with more than 100 boardings and alightings per weekday include: Ambler Student Recreation & Fitness Center, Snow Hall Westbound, and Fambrough Street & Alabama Drive. These stops serve academic buildings, such as Bailey Hall, and Snow Hall, but also provide access to key recreational facilities, including Allen Fieldhouse, Memorial Stadium, and the Ambler Student Recreation & Fitness Center. All other stops serve fewer than 92 daily boardings and alightings (Figure 8-Figure 11).

Traveling in the outbound direction, weekday ridership is highest at 18th Street and Naismith, generating 153 combined daily boardings and alightings.

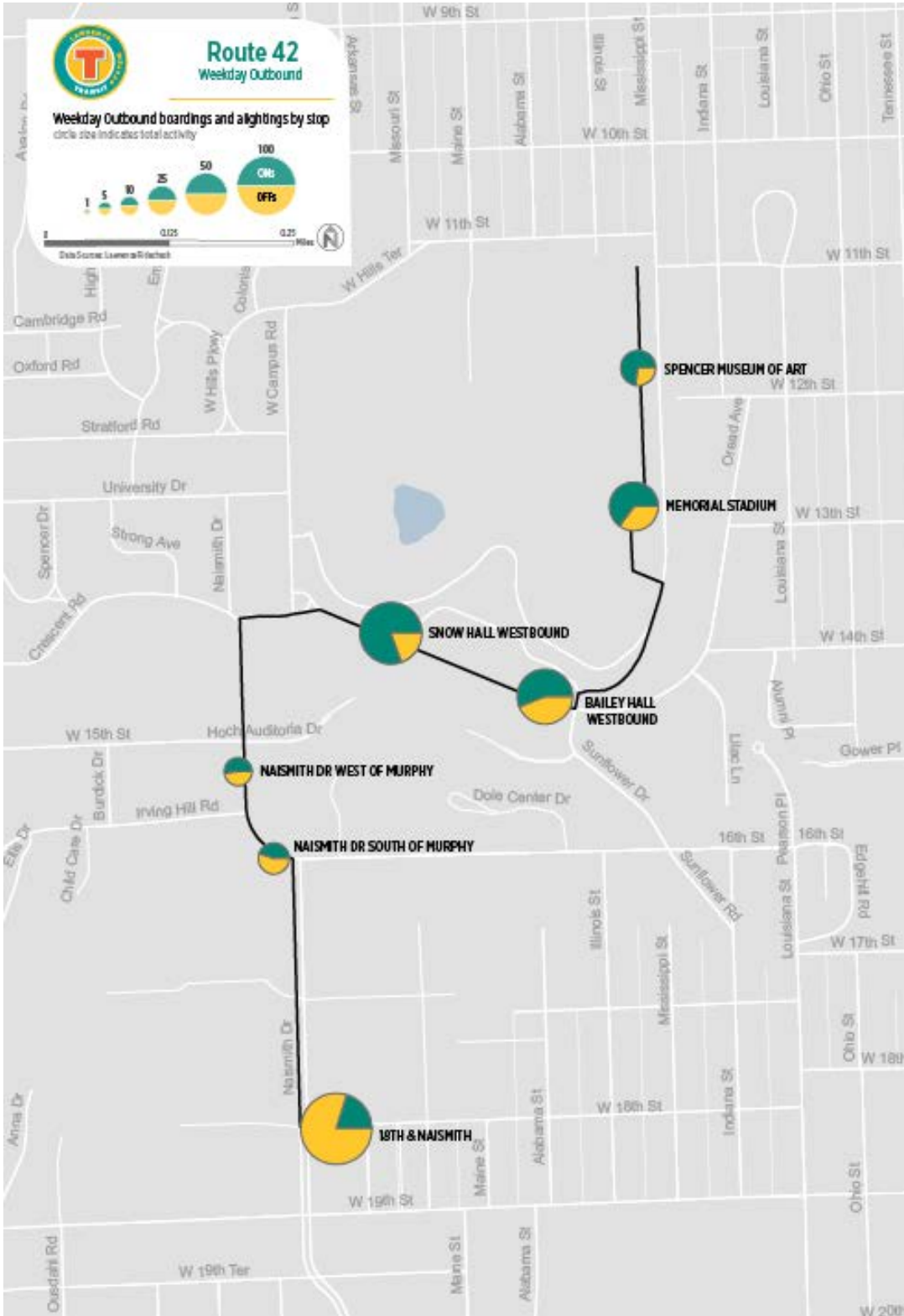
Figure 7 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Bailey Hall Westbound	428	Bailey Hall; KU campus
Ambler Student Recreation & Fitness Center	221	Ambler Student Recreation & Fitness Center
Snow Hall Westbound	171	Snow Hall; KU campus
Fambrough Drive / Alabama Street	104	Memorial Stadium; off-campus student housing
Robinson Gym	91	School of Business; Allen Fieldhouse; KU campus

*Weekday inbound ridership (boardings and alightings) for Route 42 only

ROUTE EVALUATION | ROUTE 42
 KU on Wheels

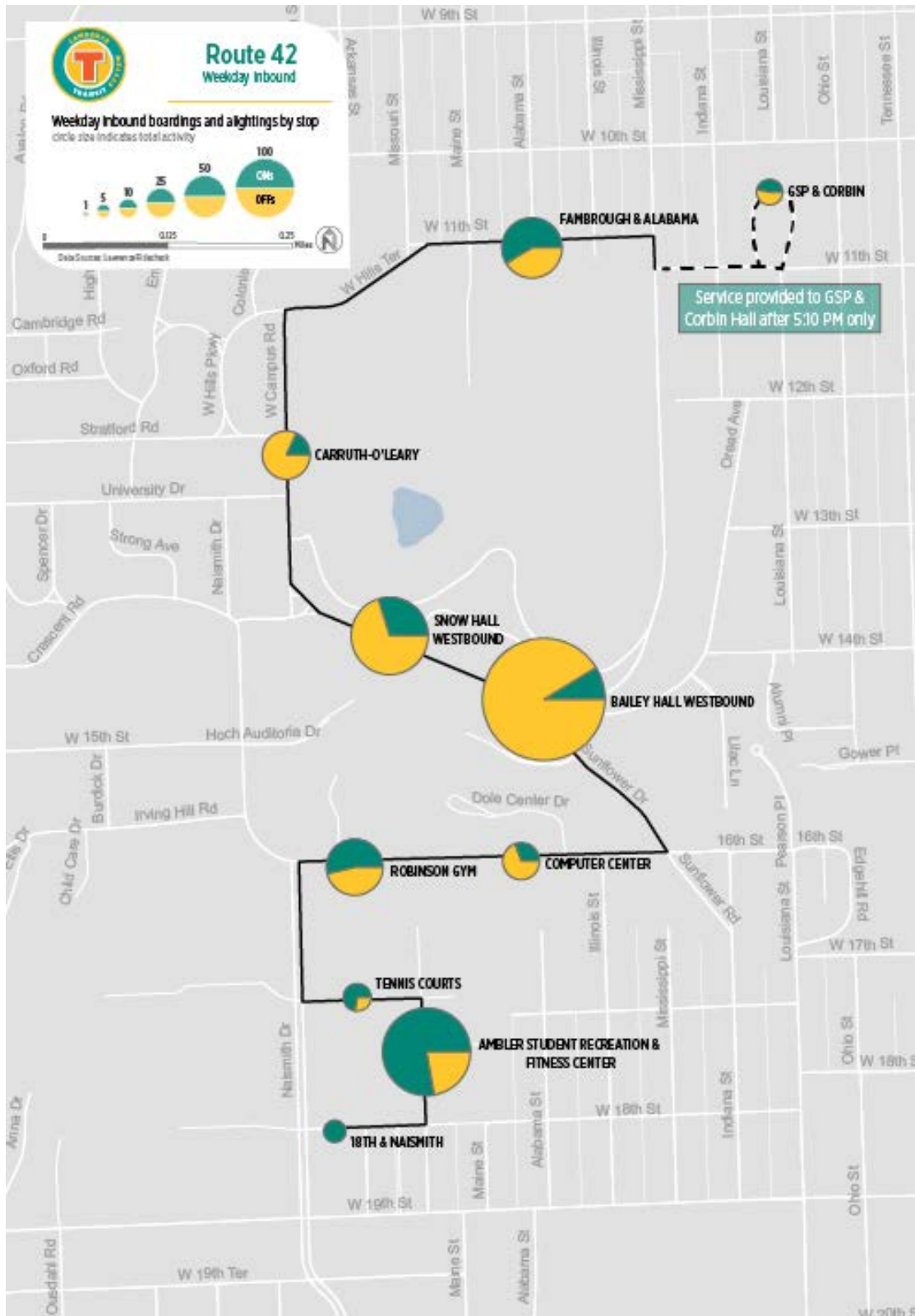
Figure 8 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 42
 KU on Wheels

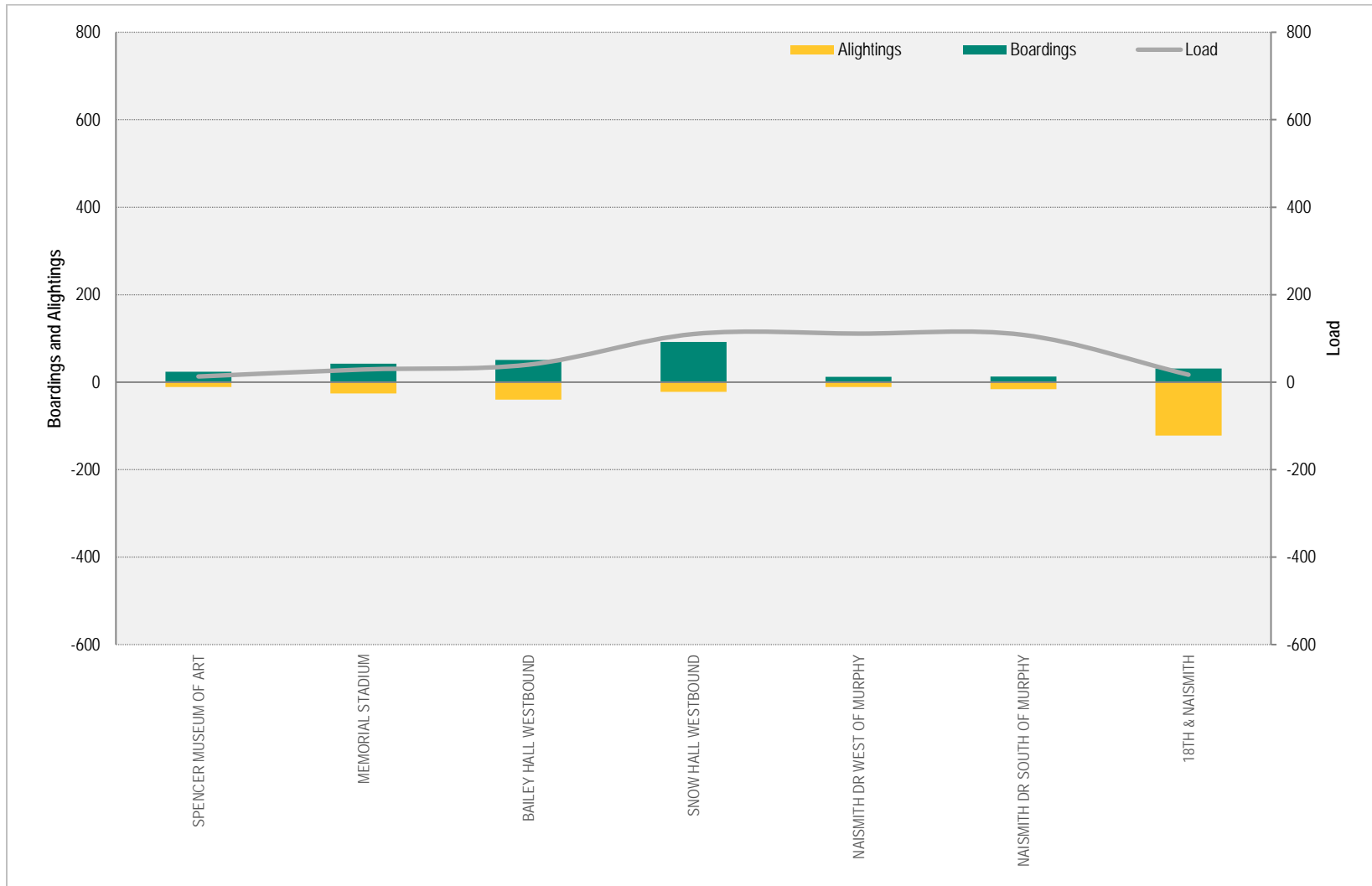
Figure 9 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 42
 KU on Wheels

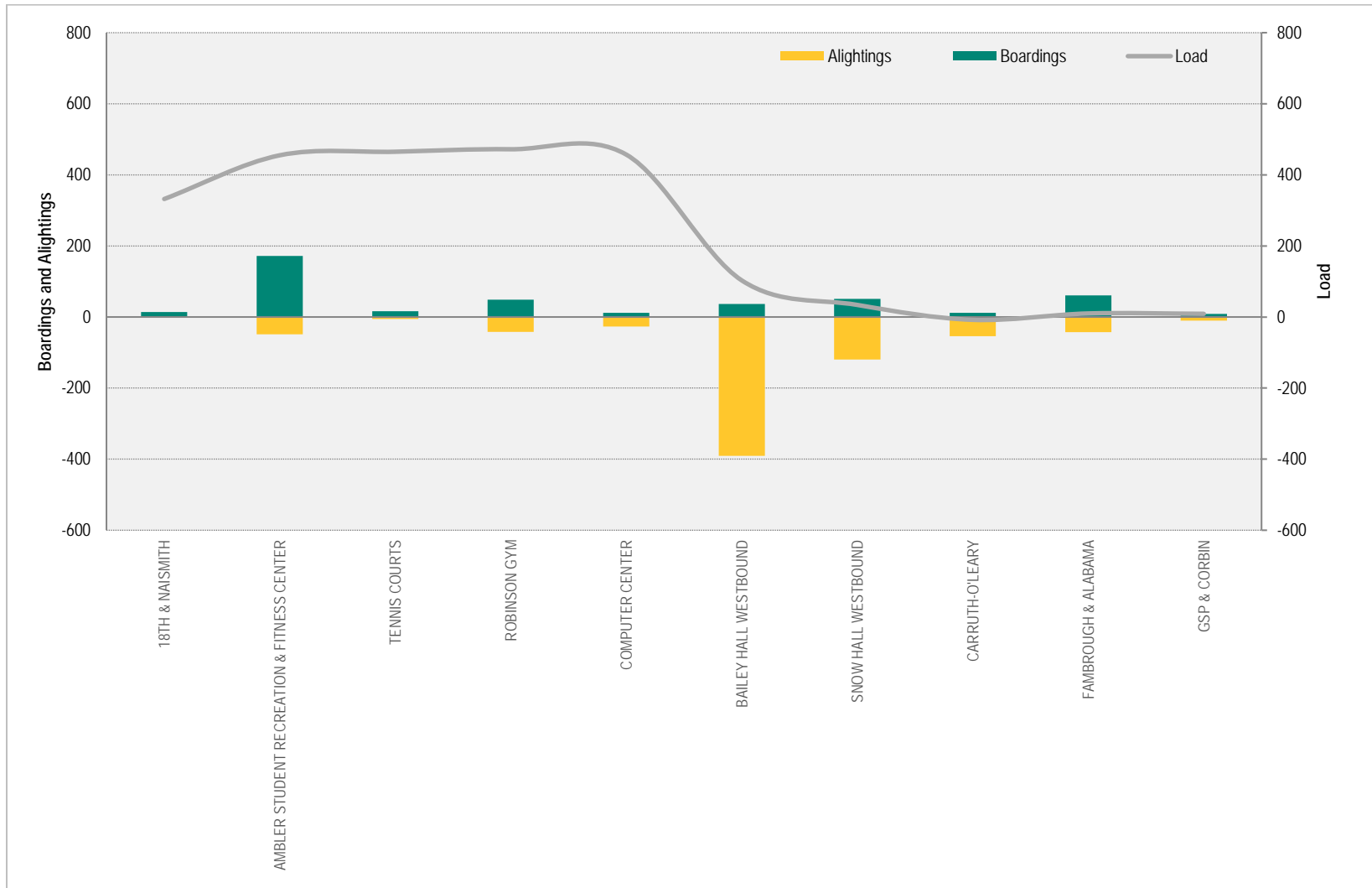
Figure 10 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 42
 KU on Wheels

Figure 11 | Weekday Inbound Ridership by Stop Chart



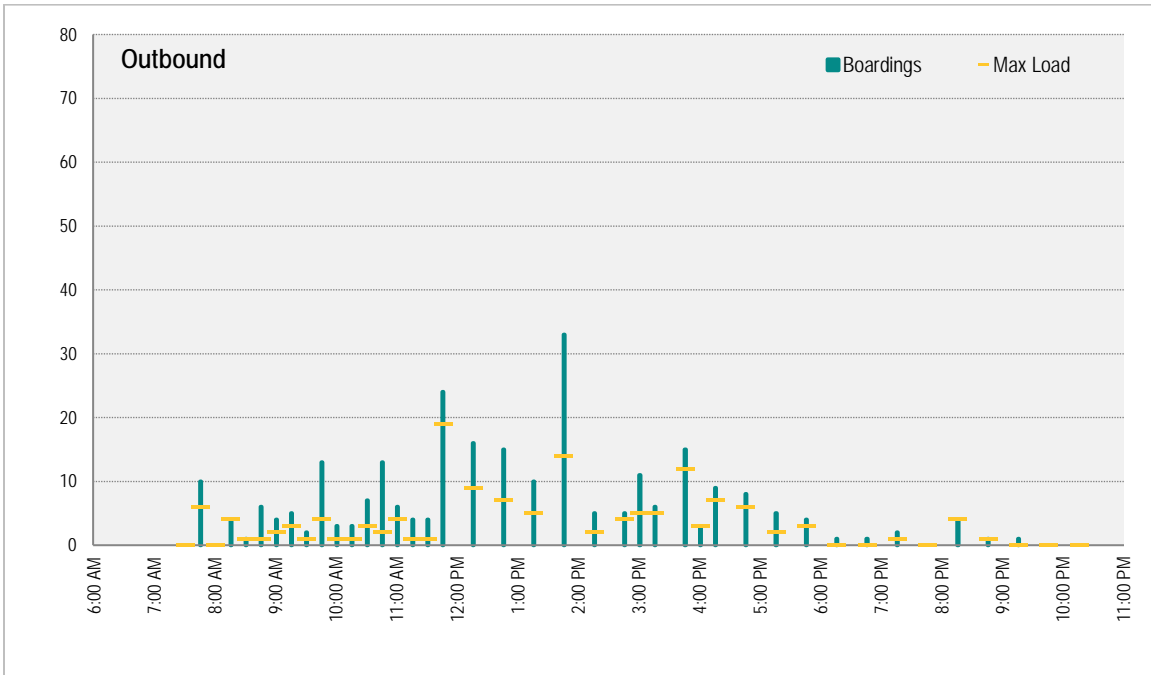
Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

On weekdays, Route 42 ridership is highest traveling in the inbound direction during the mid-morning service period (Figure 13). During this period (8:30 to 11:00 AM), ridership per trip ranges from 15 passengers to the peak of 40 passengers, at 9:10 AM. Ridership declines precipitously after 12:00 PM, and no inbound trips carry more than 11 passengers after 4:00 PM. Overall, 21% of inbound trips carry 20 or more passengers, and three inbound trips carry over 30 passengers per trip.

Weekday ridership in the outbound direction peaks at 1:46 PM, averaging 33 passengers per trip (Figure 12). The majority of outbound trips (76%) carry 10 or fewer passengers, and only two outbound trips carry more than 20 passengers.

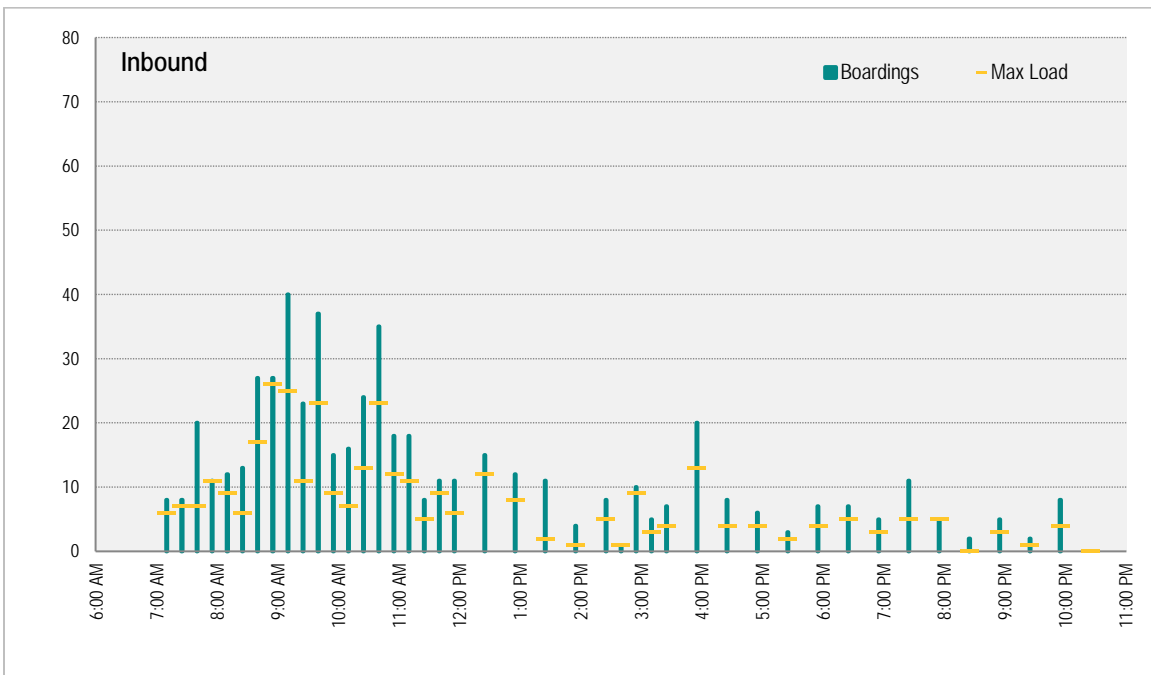
Figure 12 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Missing data for trips at 0:01 and 0:31 past the hour between 12:01-6:01 PM, except at 3:01 and 4:01 PM; a total of 11 trips are missing. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 13 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016

Note: Missing data for trips at 0:10 and 0:40 past the hour between 12:10-2:10 PM and 3:40-5:40 PM; a total of 10 trips are missing. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

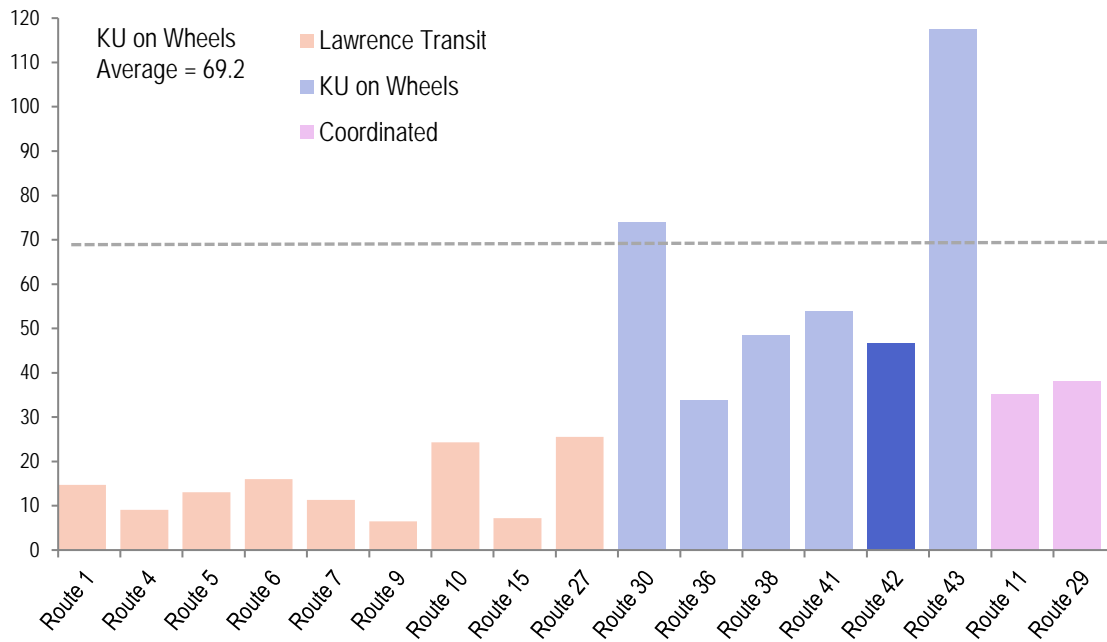
In terms of average passengers per hour, Route 42 is the fifth most productive KU on Wheels bus route (Figure 14). The route carries 46.6 passengers per hour on weekdays, 33% less than the system average (Figure 15).

Figure 14 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	KU ON WHEELS AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	1,166	25.0	46.6	69.2	5 of 6

Source: Lawrence Transit, 2016

Figure 15 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 57.1% of Route 42 time points were served “on-time” during the survey period (Figure 16). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected primarily by late departures, with over one-quarter of time points served late; 15.9% of time points were impacted by early departures.

Figure 16 | On-Time Performance

	WEEKDAY
On-Time	57.1%
Early	15.9%
Late	26.9%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 42 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Reduce One-Way Service.** Route 42 allows riders to travel from the recreation and fitness center, and adjacent parking lot, to academic destination along Sunnyside Avenue, but the one-way alignment of the route requires significant out-of-direction travel to return to the parking lot or rec center. Bi-directional service along Sunnyside Avenue would make the route more user-friendly.
- **Reduce Frequency to Every 20 Minutes.** Ridership is relatively strong on Route 42 overall, but on a per trip basis, the route is weak compared to other KU on Wheels routes. A slightly lower headway of 20 minutes may be more appropriate for the route.
- **Combine with Route 43.** Route 42's strongest ridership segments are along Jayhawk Boulevard and south to the recreational areas, labs, and academic buildings. Creating a one-seat connection between the student housing on Daisy Hill and these areas on Route 42 would provide a more useful service to students and potentially improve the route's performance. Modifications to other routes, such as Route 36 for example, could help provide service around Memorial Stadium.

KU on Wheels

ROUTE 43

Campus Circulator (Red)

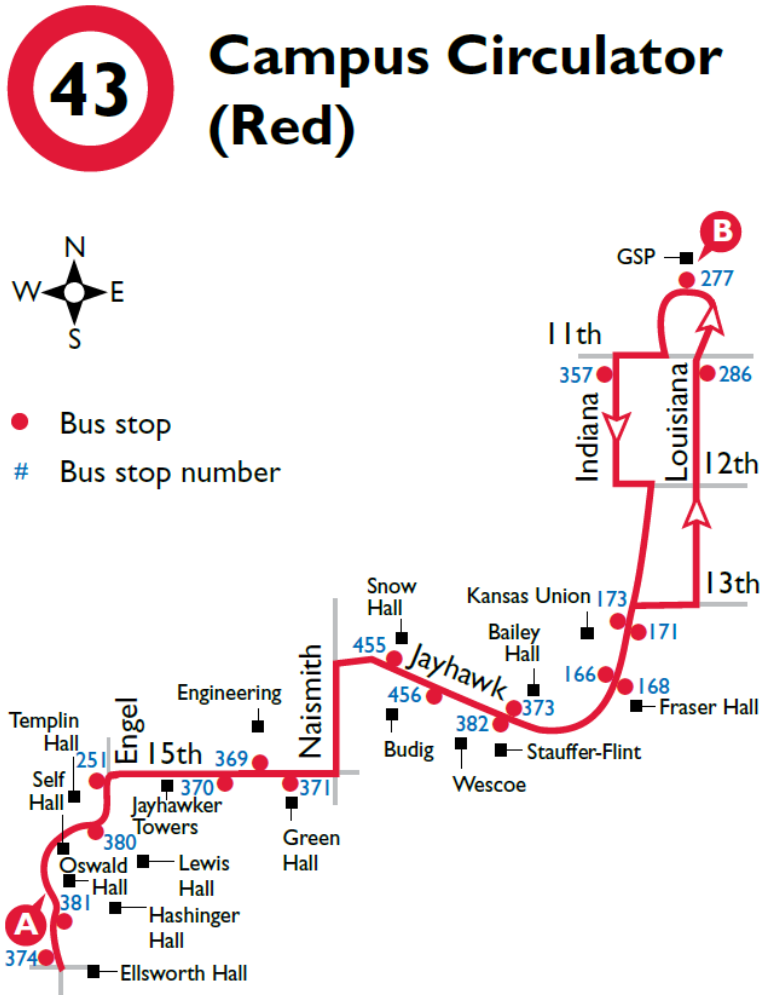
SERVICE DESIGN

Route 43 is a KU on Wheels circulator route that operates service on the campus of the University of Kansas. The route travels primarily along Irving Hill Road, Engel Road, 15th Street, Jayhawk Boulevard, Louisiana Street, and Indiana Street (Figure 1). Route 43 provides service to numerous on-campus destinations, including academic buildings, residence halls, and recreation facilities.

ALIGNMENT/SERVICE PATTERNS

Route 43 has a single consistent service pattern for weekday service. Departing outbound from the Gertrude Sellards Pearson (GSP) Residence Hall, Route 43 starts on College Drive, turns right on 11th Street, left on Indiana Street, left on 12th Street, and right on Jayhawk Boulevard, serving the Kansas Union and multiple academic buildings. From Jayhawk Boulevard Route 43 travels around the traffic circle onto Crescent Road, turns left on Naismith Drive, right on 15th Street, and left on Burdick Road, serving the Jayhawker Towers and the KU School of Law. From Burdick Road Route 43 turns right on Irving Hill Road, right on Engel Road, and right on 15th Street, returning inbound to main campus. At Naismith Drive Route 43 turns left, then right onto Crescent Road, and travels back onto Jayhawk Boulevard before turning right on 13th Street, making a final left turn on Louisiana Street, and following Louisiana back to GSP Residence Hall.

Figure 1 | Route Map



Source: Lawrence Transit: August 2015 – August 2016

SYSTEM INTERACTIONS AND TRANSFER OPPORTUNITIES

Customers can transfer between Route 43 and several Lawrence Transit and KU on Wheels routes at the Kansas Union. There are also transfer opportunities at several other points along the route, including along 15th Street (Route 10, Route 29, and Route 30) and Louisiana Street (Route 10, Route 11, Route 29, Route 36, and Route 38 (Figure 2).

Figure 2 | Primary Transfer Opportunities

LOCATION	TRANSFER TO
Kansas Union	Route 10, Route 11, Route 29, Route 30, Route 36, Route 38
Snow Hall	Route 10, Route 11, Route 27, Route 29, Route 30, Route 36, Route 38, Route 41, Route 42

SERVICE SCHEDULE

Route 43 operates service Monday-Friday (Figure 3). On weekdays, the route runs every six to nine minutes from 7:20 AM to 5:30 PM. Route 43 does not operate on Saturdays or Sundays, or when KU is not in session.

Figure 3 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (MIN)	DAILY TRIPS (OUTBOUND/INBOUND)
Monday-Friday	7:20 AM – 5:30 PM	6-9	--
Saturday	No service	–	–
Sunday	No service	–	–

Source: Lawrence Transit

RIDERSHIP

Route 43 ranks first of six KU on Wheels routes in terms of weekday ridership and first of six in terms of ridership per trip (Figure 4). On average, the route carries 5,818 passengers, or 33.2 passengers per trip, on Monday-Friday (Figure 5 and Figure 6). The route averages 117.5 passengers per revenue hour, by far the highest among KU on Wheels routes.

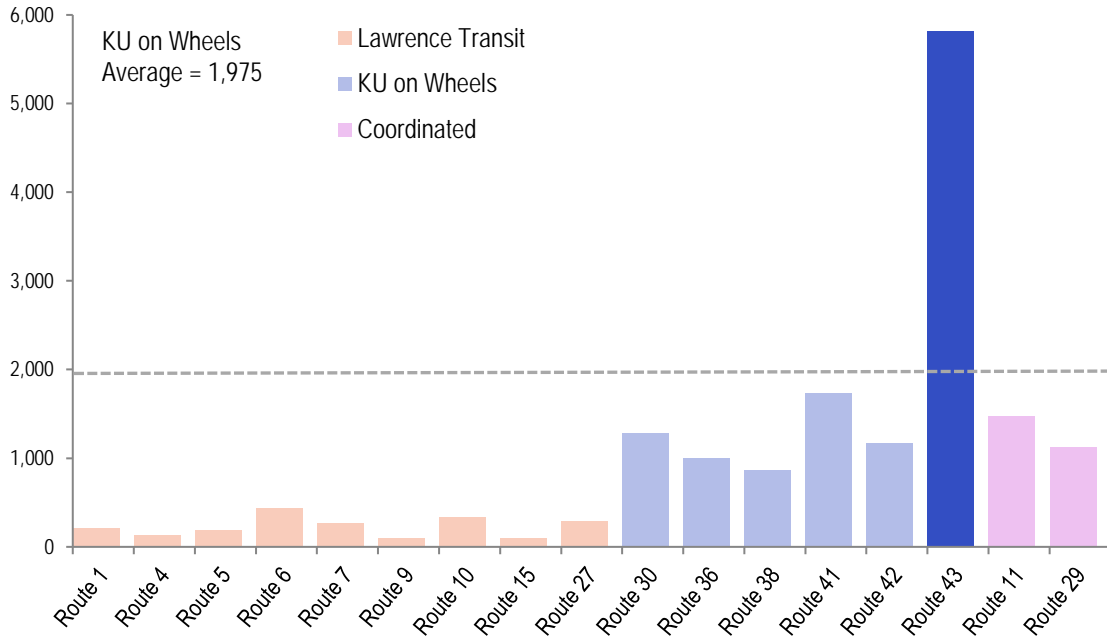
Figure 4 | Ridership Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	TRIPS	AVERAGE RIDERSHIP PER TRIP	KU ON WHEELS AVERAGE RIDERSHIP PER TRIP	RIDERSHIP PER TRIP RANK
Monday–Friday	5,818	175	33.2	22.8	1 of 6

Source: Lawrence Transit, 2016

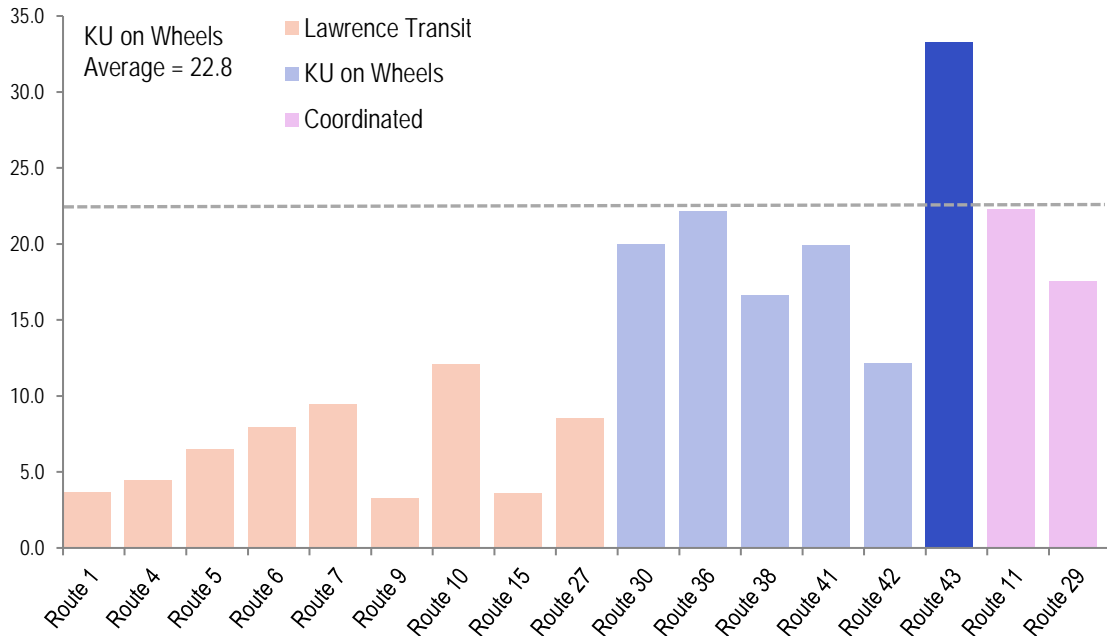
ROUTE EVALUATION | ROUTE 43
 KU on Wheels

Figure 5 | Weekday Ridership by Route



Source: Ride Check, April and May 2016

Figure 6 | Weekday Ridership per Trip by Route



Source: Ride Check, April and May 2016

RIDERSHIP BY STOP

The highest inbound weekday ridership stops on Route 43 are located on KU’s campus (Figure 7). The stop at Jayhawk Boulevard and Budig Hall features the highest ridership, generating 1,245 combined daily boarding and alightings (Figure 8-Figure 11). Six additional stops generate more than 400 combined daily boardings and alightings: Gertrude Sellards Pearson & Corbin Hall, Hashinger Hall, McCollum Hall, Kansas Union, and 15th Street and Green Hall. The remaining inbound stops generate between 140 and 301 daily passengers. McCollum Hall was demolished in late 2015, but the stop still serves students living at Ellsworth Residence Hall.

Traveling outbound, weekday ridership is highest at Bailey Hall, which generates 816 combined daily boardings and alightings. Other stops with more than 500 boardings and alightings per weekday include: Snow Hall Westbound, McCollum Hall, and Gertrude Sellards Pearson, the Engineering Department and the Kansas Union. These stops primarily serve academic buildings and residential halls. All inbound stops serve more than 250 combined daily boardings and alightings.

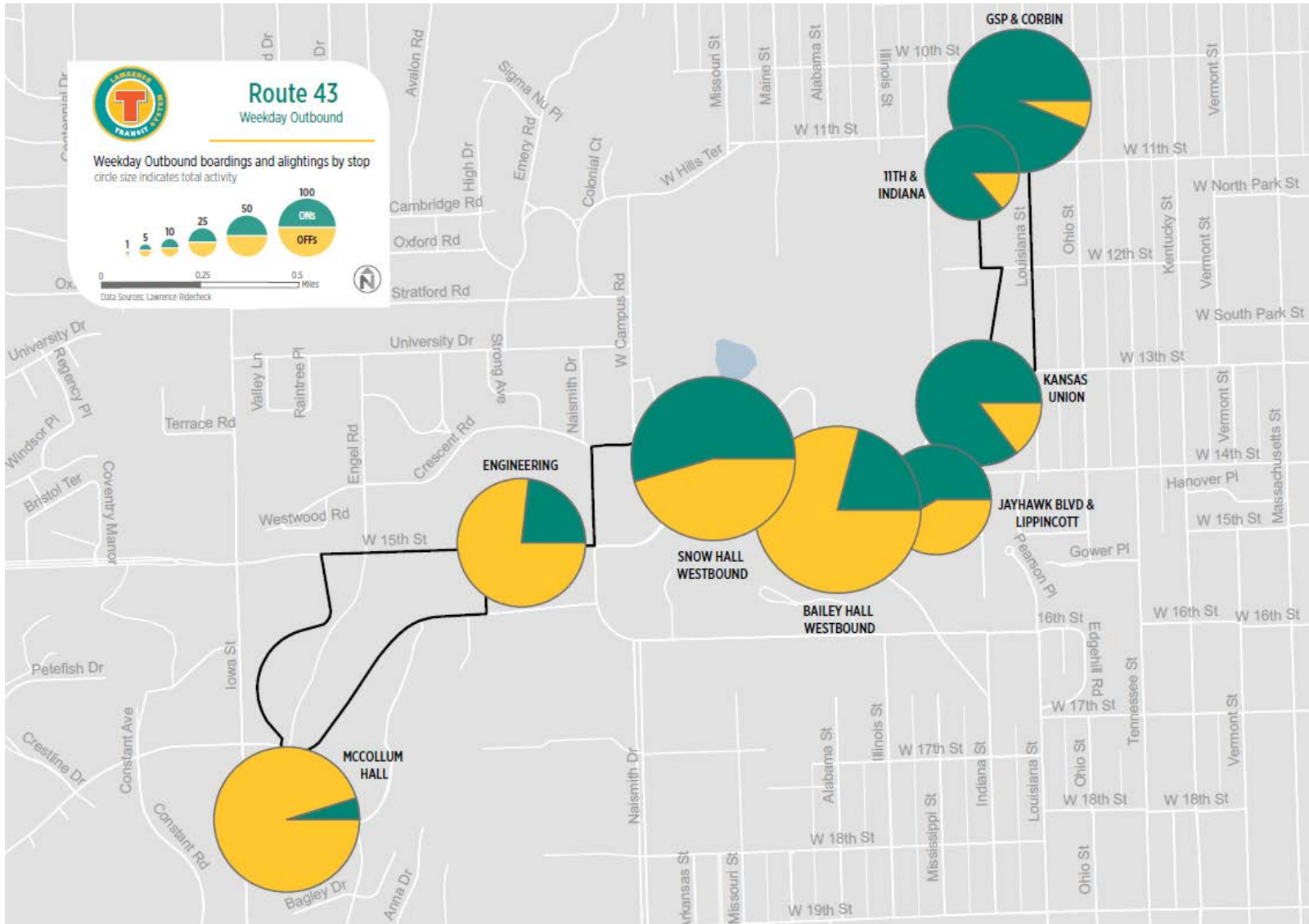
Figure 7 | Top 5 Highest Ridership Stops and Key Trip Generators (Weekday Inbound)

BUS STOP	RIDERSHIP*	MAJOR LOCAL DESTINATIONS
Jayhawk Boulevard / Budig Hall	1,245	Budig Hall; KU’s campus
GSP / Corbin Hall	511	Corbin Hall; On-campus student housing
Hashinger Hall	439	On-campus student housing
McCollum Hall	425	Ellsworth Residence Hall
Kansas Union	420	Kansas Union; KU’s campus

*Weekday inbound ridership (boardings and alightings) for Route 43 only

ROUTE EVALUATION | ROUTE 43
 KU on Wheels

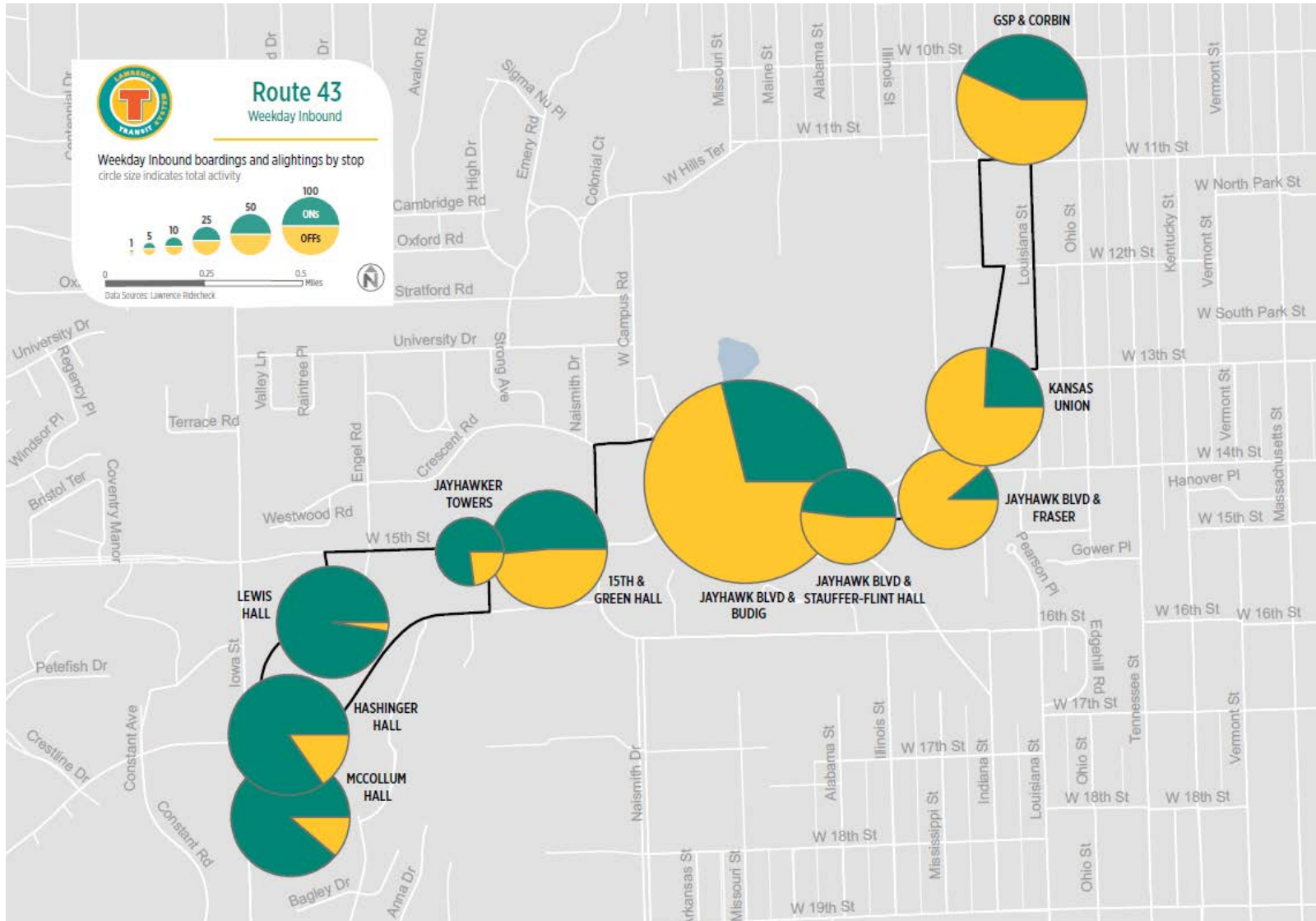
Figure 8 | Weekday Outbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 43
 KU on Wheels

Figure 9 | Weekday Inbound Daily Ridership by Stop Map



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 43
 KU on Wheels

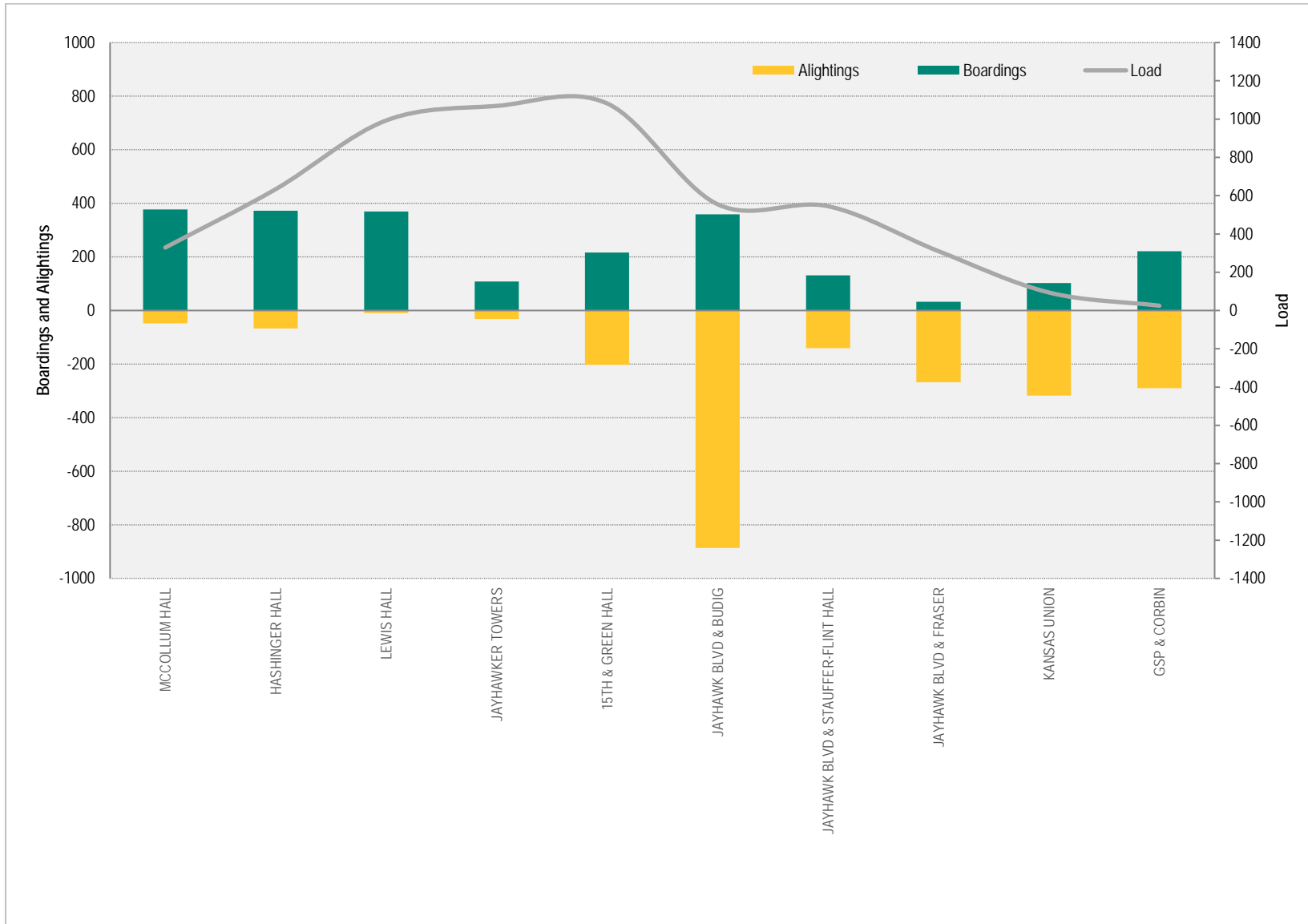
Figure 10 | Weekday Outbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

ROUTE EVALUATION | ROUTE 43
KU on Wheels

Figure 11 | Weekday Inbound Ridership by Stop Chart



Source: Ride Check, April and May 2016

RIDERSHIP BY TRIP

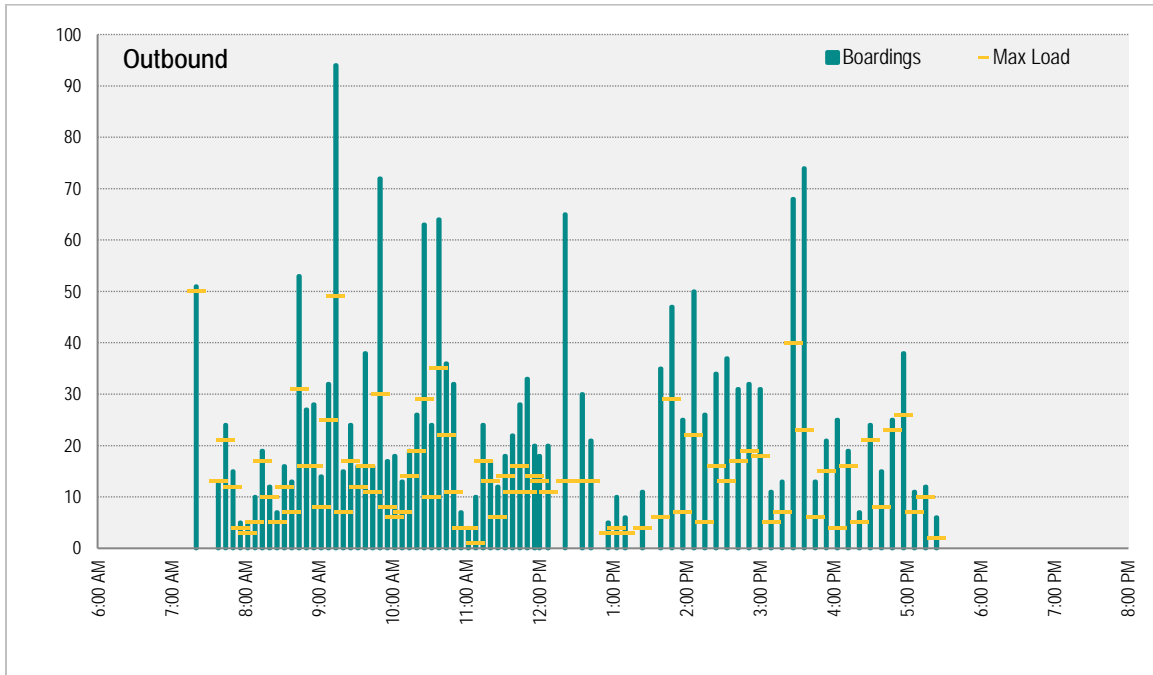
On weekdays, Route 43 ridership is highest during the late morning and early afternoon service periods (Figure 12 and Figure 13). Route 43 operates high frequency through KU's central campus, and the route is predominantly used by students traveling from residence halls to academic buildings, and vice versa. Highest ridership likely aligns with class schedules, which results in cyclical ridership trends.

Outbound ridership peaks at 9:14 AM, at 94 passengers per trip. Ridership is consistently highest from 1:30 and 3:00 PM, when all 10 trips record more than 20 passengers, and eight trips carry more than 30 passengers. Two back-to-back trips at 3:27 and 3:36 PM each record more than 60 passengers, indicating the need for an additional trip during this period. Overall, 53% of outbound trips carry 20 passengers or more.

Inbound ridership is highest between 10:00 and 11:00 AM and 12:00 and 1:00 PM. Ridership peaks at 10:32 AM, at 84 passengers per trip. From 10:00 to 11:00 AM four trips carry more than 50 passengers, and four trips between 12:00 and 1:00 PM carry more than 60 passengers. Ridership is also relatively high from 1:30 to 3:30 PM. Overall, 50% of inbound trips carry 20 or more passengers and 16% of trips carry more than 50 passengers.

ROUTE EVALUATION | ROUTE 43
 KU on Wheels

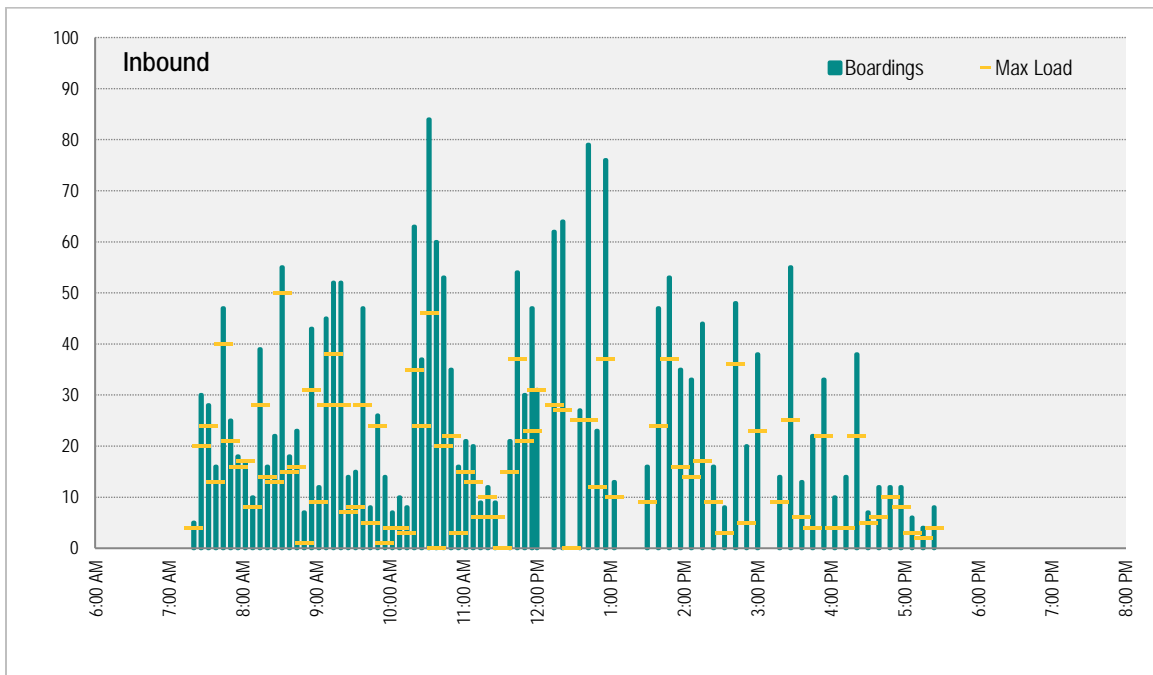
Figure 12 | Weekday Outbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: Missing data for 5 trips – 12:00, 12:07, 1:12, 1:21, and 3:18 PM. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

Figure 13 | Weekday Inbound Ridership by Trip Chart



Source: Ride Check, April and May 2016.

Note: Missing data for 9 trips – 7:26, 7:32, and 11:38 AM; 12:14, 12:28, 12:49, 1:12, 1:21, and 1:30 PM. Seating capacity of a typical 40-foot transit bus is between 35 and 40 passengers.

SERVICE PRODUCTIVITY

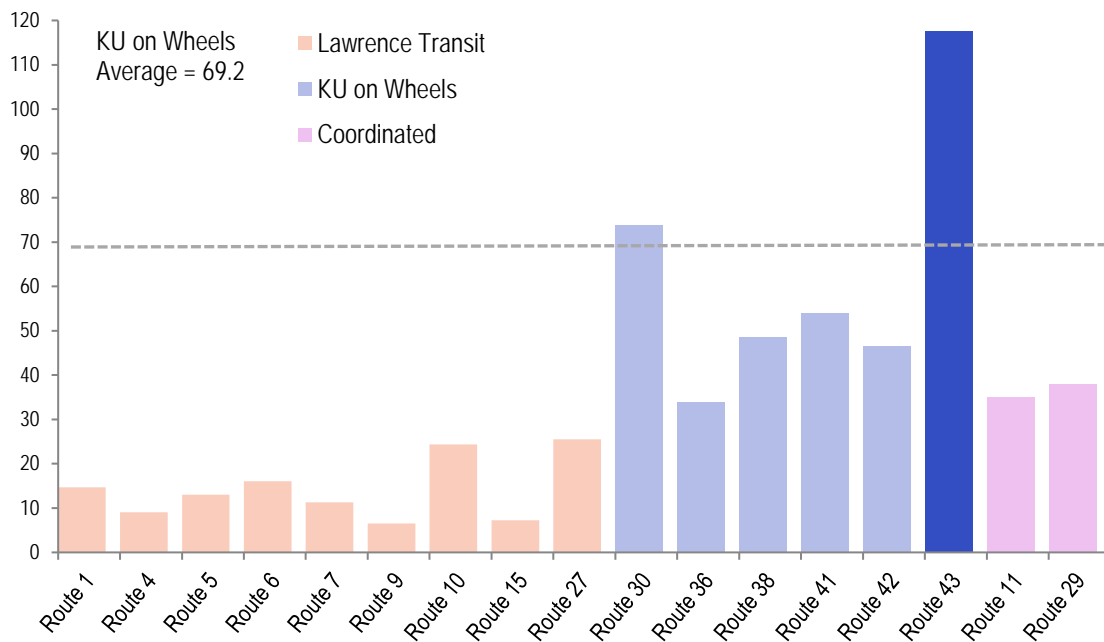
In terms of average passengers per hour, Route 43 is the most productive KU on Wheels bus route (Figure 14). The route carries 117.5 passengers per hour on weekdays, exceeding the system average by 70% (Figure 15). The route provides a short and direct connection between several KU residence halls (Hashinger, Lewis, Oswald, and Templin) and the main academic along Jayhawk Boulevard.

Figure 14 | Service Productivity Statistics

SERVICE DAY	TYPICAL DAILY RIDERSHIP	SERVICE HOURS	AVERAGE RIDERSHIP PER HOUR	KU ON WHEELS AVERAGE RIDERSHIP PER HOUR	SYSTEM RANK
Monday–Friday	5,819	49.5	117.5	69.2	1 of 6

Source: Lawrence Transit, 2016

Figure 15 | Weekday Ridership per Service Hour by Route



Source: Ride Check, April and May 2016

ON-TIME PERFORMANCE

On weekdays, approximately 19.5% of Route 43 time points were served “on-time” during the survey period (Figure 16). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was equally affected by both early and late departures. Buses departed approximately 37% of time points early, while 43.5% of time points were served more than five minutes behind schedule.

Figure 16 | On-Time Performance

	WEEKDAY
On-Time	19.5%
Early	37.0%
Late	43.5%

Note: Total may not sum to 100% due to rounding.

Source: Ride Check, April and May 2016

POTENTIAL SERVICE IMPROVEMENT OPTIONS

Opportunities to strengthen Route 43 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Simplify Schedule and Increase Service Frequency to Every 5 Minutes During Peak Periods.** Route 43 has some problems with overcrowding around class change times. The current schedule has three different headways on Route 43 depending on the time of day, with a 9-minute frequency after 1:30 PM, down from every 6 or 7 minutes before 1:30 PM. Though all the headways are short enough that riders do not need to look at or remember a schedule, a more-frequent simpler schedule would make the service even easier to use and would encourage riders who board and alight along Jayhawk Boulevard and W. 15th Street to take Route 43 instead of another route. This change could also be accomplished without a large investment in resources and will help alleviate the overcrowding on Route 11 headed southbound in the afternoon. For example, a headway of every 5 minutes from 8:30 AM to 3:30 PM, and a headway of every 10 minutes at other times would create about 100 one-way trips during the day versus about 90 one-way trips currently. The peak period on Route 43 according to current ridership patterns is between 8:30 AM and 3:30 or 4:30 PM.
- **Extend Service Later than 5:30 PM.** Ridership on Route 43 does begin to drop around 4:30 PM as classes end for the day, but there may be demand for service after dinner time to reach study or recreational areas based on ridership on other routes and typical campus circulation patterns at other universities. With limited service during this time on traditional KU routes, the demand for transit is somewhat unknown. But, with additional campus connections, and strong existing ridership on Route 43, providing later service on this route may prove popular with students who would otherwise have a difficult time navigating campus after about 5:30 or 6:00 PM.
- **Combine with Route 42.** Route 42's strongest ridership segments are along Jayhawk Boulevard and south to the recreational areas, labs, and academic buildings. Creating a one-seat connection between the student housing on Daisy Hill currently served by Route 43, and these areas on Route 42 would provide a more useful service to students and potentially improve the route's performance. Modifications to other routes, such as Route 36 for example, could help provide service around Memorial Stadium.