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Travel Speed over the Longue Durée

Jacob R. Hall[1,*]
[1]*Salmon P. Chase Center for Civics, Culture, and Society at The Ohio State University, Columbus, Ohio 43210, United States*

*Corresponding author: Email: hall.2743@osu.edu

In the premodern world, slow travel speed increased a ruler's governance costs and acted as a barrier to trade. But current estimates of medieval European travel speed are sparse, and the estimates that do exist rely on parsimonious data. Using the daily travel itineraries of medieval kings, I create near-continuous time series of travel speed along roads in England and France over four centuries. Average travel speed along the Medieval roads is estimated to be around 15 to 20 miles per day. Those average estimates remain fairly stable over the entire medieval period, although there is a great amount of heterogeneity at the journey level.

1. Introduction

Fernand Braudel called distance "ennemi numero un" (Braudel 1972). It earned that status in the premodern world because it made trade and governance costly and difficult. The tight grip that distance had on Europeans would not be loosened until the Transport Revolution in the 19th century (Bogart 2014, 2019). When we look back at medieval travel speed, we know it was comparatively slow. But many of the current estimates of travel speed in medieval Europe rely on only a few journeys and are circumscribed to a particular time and place. In this paper, I provide novel data on travel speed spanning four centuries for both England and Wales and continental France. My goal is to explore travel speed over the *longue durée* and to provide economic historians doing applied econometrics with reasonable estimates for travel speed.

In the premodern world, travel time was the most important determinant of transport costs (O'Rourke & Williamson 2001). Many different models that study the size and shape of the territorial state contain a parameter for travel speed or transport costs (Acharya & Lee 2018, Blum & Dudley 1989; Fernández-Villaverde *et al.* 2023; Friedman 1977). The amount of land a ruler could hold was a function of how long it took him or his army to traverse it. Slower travel speeds translated to smaller territorial states, lower fiscal legibility, and a more decentralized governmental hierarchy (Garfias & Sellars 2022; Mayshar *et al.* 2017). It also made it more difficult for the central government to govern the periphery of the polity (Alesina *et al.* 2020). Stasavage (2010) demonstrates that more compact polities, and thus quicker to traverse polities, were more likely to be home to effective representative assemblies. Also, given that most medieval monarchs were itinerant, travel speed directly constrained their actions (Hall 2025).

Slow travel speeds translate into high transport costs, which acted as a barrier to premodern trade and thus to fuller market integration. Medieval cities required foodstuff from the rural

hinterlands to feed their population. Transport costs placed a maximum limit on the potential size of premodern cities (Dittmar 2011; Jedwab *et al.* 2022; Motamed *et al.* 2014). Simply having better access to the transport network was important for urban growth (Flückiger *et al.* 2022; Michaels & Rauch 2018).

The perfect data for studying medieval travel speed over the long run would consist of numerous journeys in a wide variety of places taken by different types of travellers in as many years as possible. But that perfect dataset does not exist. Scarcity brings trade-offs. One potential way forward, taken by Boyer (1951) and Scheidel & Meeks (2015), is to catalog journeys for as many different types of traveller in a single region and time period. In this paper, I take the opposite approach. I focus on a single type of traveller, itinerant monarchs, and estimate their travel speed over multiple centuries. By focusing solely on itinerant monarchs, I am able to treat many aspects of the traveller and the nature of his journeys as being relatively constant. Also, the number of journeys at our disposal allows idiosyncratic aspects of any one particular journey to be averaged out, creating more precise estimates of medieval travel speed than currently exist. The trade-off is that generalizing to other types of traveller should be done with caution.

To shed light on the spatial and temporal patterns of travel speed during the Middle Ages, I estimate royal overland travel speed using data on the daily location of the king of England from 1199 to 1547 and the king of France from 1461 to 1589. Throughout the paper, I discuss travel speed in terms of miles per day (mpd). I find that average royal travel speed along the medieval roads is around 15 to 20 mpd, but also that there is wide variation at the journey level.

Before journeying out on our own, we first must survey those who have travelled down the same road. With a few notable exceptions, most of the cited literature below merely report average travel speed before moving on to a larger discussion of medieval travel or infrastructure. They do not provide their underlying data, detail their estimation process, or discuss travel speed in a detailed manner.

The online ORBIS project (Scheidel & Meeks 2015), the product of Walter Scheidel and Elijah Meeks, provides travel speeds for Roman Europe in 200 CE.[1] For travellers on foot with moderate loads, travel speed is cited as being about 19 mpd. Travel speed for non-military, vehicular travel is reported as being slightly faster: 22 mpd for routine journeys and 31 mpd for accelerated travel. Routine travel on horseback is said to have been 35 mpd.

Kanter (2011a) estimates 13th century England's King John (r. 1199–1216) to travel at an average speed (*including* rest days) of 13 mpd. Stretton (1934), writing about the travelling elite households of the early Middle Ages, says average travel speed was around 14 or 15 mpd. Warren (1978) attributes King John with faster speeds of 20 to 30 mpd. Berman (1983) gives similar figures. Prestwich (2016), relying on the itinerary of Edward I (r. 1272–1307), writes: "Rates of travel varied considerably. It was not common to travel over twenty miles in a day, and fifteen miles seems to have been a comfortable distance". Relying on the itineraries of a handful of European nobleman and popes of the Middle Ages, Ludwig (1897) estimate's a normal day's journey of being about 24 miles. Bursts of speed were certainly possible. Haskins (1915) reports Henry II of England (r. 1154–1189) covering 175 miles on horseback in 2 days for an average speed of 88 mpd.

In her 1951 *Speculum* article, Marjorie Nice Boyer surveys 45 journeys in 14th century France and concludes that "most journeys were probably made at a rate between twenty and thirty miles (per day)" Boyer (1951, 606). Speeds in the area of 40 to 50 mpd could be achieved

[1] ORBIS can be found online at: https://orbis.stanford.edu.

by messengers, royal officials, and servants—or as Boyer calls them, "persons under pressure to produce results" (Boyer 1951, 604). Warren (1978), citing Cole (1844), concurs on the faster speeds of messengers. By the late 15th century, Pound (1979) says an "ordinary European traveller" could achieve 31 to 43 mpd, but the sources for his estimation are opaque (58).

Fast forwarding to 1680, where economic historians are on a stronger footing in terms of data, average passenger travel speed in Britain by road was 48 mpd and average freight speed by road was 24 mpd (Alvarez-Palau *et al.* 2017; Gerhold 2005). But in the 18th and 19th century, Europe underwent what has come to be called the Transport Revolution (Bogart 2014). In Britain, assuming a 10-hour travel day, average passenger speed via the stagecoaches had increased to 30.6 mpd by the 1760s, 50.5 mpd by the 1800s, and 79.6 mpd by 1830 (Bogart 2005, 506). Bogart *et al.* (2026) reports similar estimates for both private and hired carriages.

The remainder of the paper proceeds as follows. Section 2 provides historical background on European itinerant monarchs and their travelling entourage. Section 3 details the data and method used for calculating travel speed. Section 4, the core of the paper, discusses long run trends in royal travel speed for England and Wales and France. In Section 5, I compare my estimates to the extant estimates for other types of traveller. Section 6 explores a few potential determinants for medieval travel speed. Section 7 concludes.

2. Our traveller: the itinerant monarch

Medieval European kings were itinerant. Rather than govern from a stationary court in the capital city, they travelled around their kingdom extensively. They were constantly in motion, rarely remaining in place for very long. At the height of his reign, England's King John moved the court an average of 220 times per year. It was "a government of the roads and of the roadsides" (Jolliffe 1963, 140). Figure 1 show the geographic extent of the royal visits for England and France.

The king's itinerary was dynamic and governed solely by him. Only the king determined where he would go and when he would leave for the next destination. The king's route was not published, or even planned, very far out in advance (Church 2007). At most, the locations were planned by stages a few weeks in advance to give the court's movements some structure and allow some sense of predictability for those who wished to visit the king (Church 2007; Given-Wilson 1986). But plans could change at a moment's notice, and unexpected decisions were to be expected.

The core departments of the royal government travelled with the king. In the case of England, that would have been the chancery and the household wardrobe. On top of that were the departments that were responsible for the logistics of the court.[2] In addition, the royal court was followed by a host of lay and ecclesiastical guests, foreign diplomats, merchants, and a host of loiterers (Church 2007; Warren 1986). Although it is difficult to perfectly estimate the size of the royal entourage, even at its least populous, the English king's entire entourage numbered no less than 500 souls (Carpenter 2007; Crockford 2016). The king's baggage train had between ten and twenty carts, which translates to a carrying capacity of 7.5 to 15 tons (Prestwich 1997, 2007).[3]

[2] They were the pantry, the buttery, the kitchen, the poultery, the stables, the saucery, the hall and chamber, the scullery, and the spicery.

[3] Masschaele (2010) reports that a medieval cart had a carrying capacity of about three quarters of a ton.

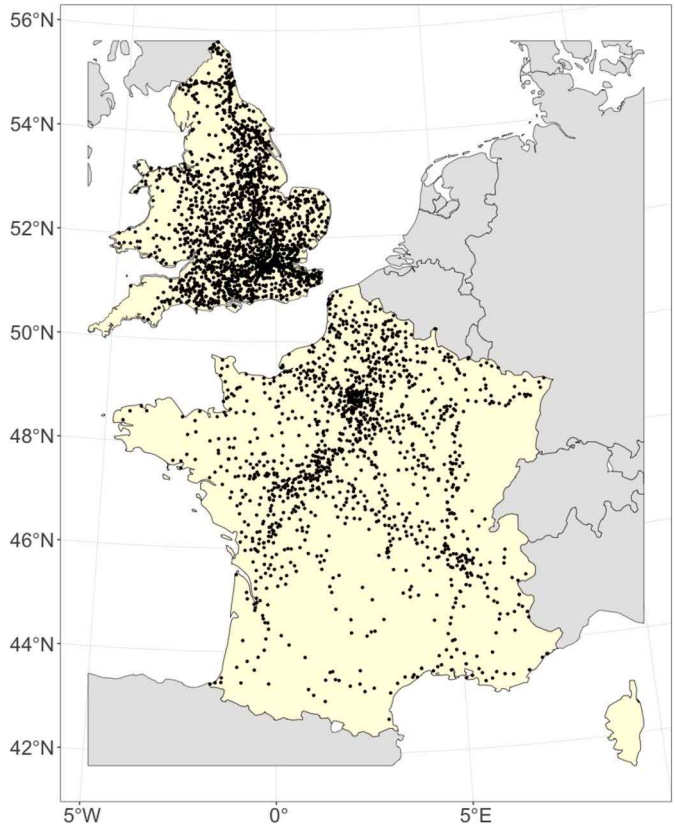

Figure 1. English and French royal travel. *Note*: Each point represents a visited location. Points in England and Wales are from 1199–1547, and for France from 1461–1589. See Section 3 and Table A1 for details.

The travel speed of the king was dictated, on the margin, by the travel speed of the baggage train, as he would never want to be too far away from it. But the king and court could travel in such a way that allowed the king to mitigate that problem, and occasionally travel faster than one might initially expect. In fact, it is a slight misnomer to say that the entourage and baggage train travelled *with* the king. It is not the case that everyone set off to the next stop on the itinerary as a cohesive unit. The royal government and its baggage train were often sent on a direct route along the projected itinerary, while the king and a few men went off on their own business, rejoining the main party later down the road (Warren 1978). Other times the main party would remain stationary, while the king travelled the area with a smaller, more personal group before returning days later (Given-Wilson 1986).

Most of the historical scholarship on itinerant monarchs attests to their frequent use of the road (Church 2007; Jolliffe 1963).[4] Hindle (1976) highlights the continued use of

[4] The words "strete" and "wei" are the more historically accurate words. The word "road" did not take on its modern-day meaning until much later. The Middle English Compendium gives the definition of "rode" as "Riding; a ride, journey on horseback" and a "voyage". By 1755, Samuel Johnson's Dictionary defines "road" in the modern sense, as "Large way; path".

the road route from Northampton to Newcastle via Geddington, Nottingham, Tickhill, Doncaster, Pontefract, York, Northallerton, Darlington, and Durham. Another popular route was Windsor to Marlborough via Reading or Freemantle and then, if the king so pleased, on up to Bradenstoke, Gloucester, and Worcester. The king and his court, in both England and in France, also made use of inland rivers to get to their destination (Knecht 2007; Prestwich 2016).[5] During the reign of Henry VI, a royal barge was permanently stationed at Lambeth and a royal ferry at Sheen for riverine passage to Westminster and elsewhere (Wolffe 2001). Prestwich (2016) reports a handful of royal trips using inland waterways taken by Edward I. For example, in 1300 Edward travelled by boat on his journey from Peterborough to Soham and again from Boston to Lincoln.

But a few examples of royal riverine travel do not say much about its frequency. Considering the totality of the evidence on the navigability of medieval rivers, the examples given are closer to notable exceptions than they are evidence for an established practice. Of the many natural rivers in England and Wales, the steep river gradients and the modest annual precipitation levels resulted in only a few rivers that were navigable over long distances during the Middle Ages (Satchell 2017, 6). There are documented accounts by royal purveyors of water levels in the river being too low (Masschaele 1993, 268). Weirs for fishing and mills "choked up rivers" and posed an obstacle to navigation by the early thirteenth century (Langdon 1993). Also, the maintenance of rivers was burdensome and impractical until the mid-sixteenth-century legislative reforms, which replaced the Commissions of Sewers and enabled toll-based management and compulsory acquisition.[6]

3 Data and measurement

To measure European travel speed over the long run, I collect the royal travel itineraries of the medieval kings of England and France. The itineraries provide day-level data on the location of the king for every year of his reign. The detail of the itineraries allows for the construction of fine-grain travel journeys, although they do not provide a detailed route map or directions. The series for England is long and continuous, containing every king of England from 1199 to 1547. The series for France is limited to the kings of the Valois dynasty from 1461 to 1589.

The sources for the individual itineraries can be found in Table A1. The itineraries were assembled by a number of individual historians relying on primary source documents. When the king issued a writ, a copy that included the location and date would be created and lodged in the Chancery's records. In all of the English itineraries, and most of the French itineraries, their contents are constructed using these administrative documents, including the chancery rolls, the accounts of the household wardrobe, the privy seal, and the secret seal, amongst others. When such official government documents are unavailable, correspondence letters often serve to locate the king. In theory, the itineraries follow the movements of the king rather than simply the baggage train.

I do not alter the contents of the itineraries in any way. My contribution to their development is in bringing them together, digitization, and geo-referencing. For a select few monarchs I have multiple sources. I default to using the most up to date publication, and only use earlier sources when more recent scholarship contains a gap in coverage. For example,

[5] During these journeys, however, the majority of the royal entourage, likely remained on dry land and took an alternative route (Knecht 1984; Prestwich, 2016).

[6] I thank an anonymous referee for making this point to me.

Table 1. *Example itinerary.*

Day	Place	Journey Id
1	Ilsington	1
2	Buckfastleigh	1
3	-	-
4	Newton Ferrers	2
5	Plympton	2
6	*(Plympton)*	2
7	Plympton	2
8	Ermington	2
9	-	-
10	Chudleigh	3
11	Bishops Clyst	3
12	Honiton	3
13	Honiton	3
13	Lyme	3
14	Loders	3

Edward I's itinerary compiled by Kanter (2011b) contains a large gap in the middle of his reign.[7] I thus supplement it with Safford (1974), which Kanter (2011b) uses as one of her own sources. I limit the itineraries to only those locations within the country's (modern day) borders. Travel outside of the country's borders may be biased by warfare or other reasons to travel faster or slower than normal.

Calculating travel speed is conceptually easy. Speed is equal to the distance covered divided by the time it takes to cover that distance. But to calculate travel speed properly using the itineraries we have to overcome a few hurdles.

The king is travelling constantly, ruling his kingdom from the road. He stops somewhere to eat and sleep every night and occasionally stays in one location for an extended time to relax or conduct business. But the journey itself really never ended. Thus, what constitutes the start and end of his journey is fairly ill-defined. He was not a stage-coach that runs from London to Newcastle and back again.

Lacunae in the itineraries also pose a problem when calculating travel speed. Table 1 gives an illustrative example using a constructed itinerary. On the 2nd, the king is in Buckfastleigh, and on the 4th, he is in Newton Ferrers. But we do not know the king's location on the 3rd. He could have been in Buckfastleigh, in Newton Ferrers, on the roadside in between the two places, or some other third place in the area. Including the days where we do not know the king's location would increase the number of journey days without increasing the distance travelled. At best, biasing travel speed downward, and at worst resulting in a measure more approximating frequency of movement rather than speed of travel.[8]

To get around both problems, I create journeys where the beginning and end are defined around, but do not include, lacunae in the itineraries. Thus, referring back to Table 1, the

[7] The reason for this will be familiar to us all: the scarcity of time. Julie Crockford (née Kanter) writes in her doctoral dissertation: "Given restraints of time, it has not been possible to analyze every year in the reigns of John, Henry III and Edward I" Kanter (2011a, p. 70)

[8] Boyer (1951) criticizes the estimates of Ludwig (1897) on these grounds.

lacunae on the 3rd and 9th mark the break points between each constructed journey. Lacunae such as on the 6th, where the location before and after are the same, are filled in assuming the king stayed put.[9]

Distances between each location are calculated using the shortest travel path along known medieval roads.[10] The location of the British medieval roads are from Hindle (1989), and those for France come from Firnhaber-Baker & Owens (2021). Figure A3 maps the roads.

In determining the king's route, I do not take account of the king's direction of travel in terms of whether he is traveling uphill or downhill. Traveling uphill would clearly slow the king down, while going downhill speeds him up. Nor do I account for road quality or safety, both of which would affect the chosen route of the king and his travel speed. It is difficult to say how these cross-cutting factors impact the final estimate of average speed. Nevertheless, I have no reason to suspect that the king was more likely to favor a particular direction of travel relative to other travellers at the time.

The travel speed of each journey is calculated by dividing the total distance of the journey by the number of travel days. The travel speed of individual journeys may vary depending on the length of the journey, the location of the journey, the season of travel and its severity, but also more idiosyncratic elements like the king's stamina level or his sense of urgency. Thus, travel speed for individual journeys will be highly variable. But longer run trends in travel speed should better reflect fundamental determinants such as technology or the quality of infrastructure.

Given the fact that the itineraries are at the day level, and we do not know the exact time the king departed, the day is the lowest unit of time that speeds can be expressed. Of course, that is no matter because days are the most useful unit for expressing travel speed in the Middle Ages. But journeys across very short distances with only one travel day will result in downward biased travel speeds because in those cases the appropriate unit of speed is miles per hour rather than per day. To circumvent that problem, I drop all journeys with only one travel day (such as journey 1 in Table 1).

Another potential problem is extreme, unbelievably fast estimates that are the products of underlying inconsistencies or impossibilities in the royal itineraries. In his work on the speed of news in England during the War of the Roses, Armstrong (1948) reports speed estimates of 100 mpd for messengers employing relays. The king would never have been able to attain such speeds, so I drop the few road journeys with speeds over 100 mpd. For France, I drop 8 journeys (1.9%). There are zero journeys over 100 mpd in England and Wales.

4. Royal travel speed over four centuries

4.1 England and Wales, 1199–1547

I create 1,311 distinct journeys that the English king took within England and Wales from 1199 to 1547.[11] Figure 2 plots the 50-year moving average of non-winter, royal travel speed

[9] I follow Hindle (1976) in making this assumption.

[10] This is an improvement over the estimation process of Boyer (1951) and Kanter (2011a,b), who simply used modern roads.

[11] Figure A1 plots the number of these journeys by decade.

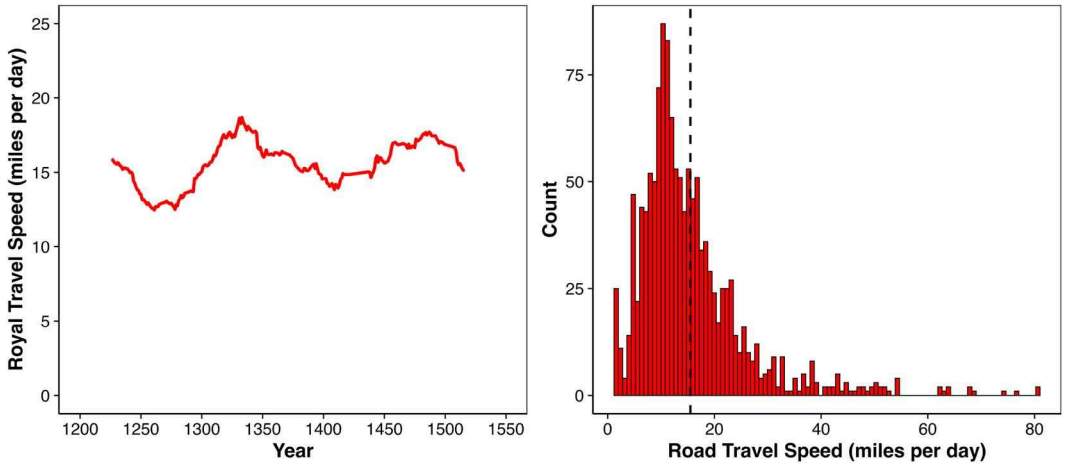

Figure 2. Royal travel speed in England and Wales. *Note*: The left panel shows the 50-year moving average of royal travel speed on roads. The right panel shows the distribution of recorded speeds.

in England and Wales.[12] Travel speed is relatively stable over time, hovering around 15 mpd over the span of Middle Ages.

The estimated road speeds for the 13th century presented here are more in line with the estimates of Kanter (2011a,b), Stretton (1934), and Prestwich (2016) than they are with the slightly faster estimates of Warren (1978). The road speed estimated here is about 10 mpd slower than average freight speed by road in 1680. This speed differential likely stems from the size of the royal baggage train rather than from an improvement in road travel over the intervening period.

Although there is stability in the average travel speed over time, travel speed varies greatly from journey to journey. Speaking about the 16th century, Fernand Braudel said that the essential point to be made about travel speeds is "the wide range of times taken to travel the same journey," going as far to say that it was a "*structural* feature of the century" (Braudel 1972). Braudel highlights the variability of the weather and in the quality of the tracks and roads. His words seem just as true for the 13th or the 15th centuries. Figure 2 also plots the distribution of estimated travel speeds. Estimated travel speeds range anywhere between 2 and 81 mpd with a mean of around 15 mpd and a median around 13 mpd. As Braudel said, "Irregularity was the rule" (Braudel 1972).

The itinerary of Edward III (r.1327–1377) is unique in that it provides both the location of the privy seal, which is the personal seal of the monarch, and the location of the wardrobe, the primary office of the king's travelling government. It does so for most years between 1327 and 1345.[13] Assuming that the privy seal denotes the location of the king, which is a good

[12] During the winter, the roads were often in rough shape and the water level of rivers would be higher, both of which would encourage riverine travel over road travel. Winter is defined as comprising the months of December, January, and February.

[13] It does not do so, nor is it possible, for the years 1330, 1335, 1338, 1339, 1342, and 1343 as the *dieta* rolls are missing or damaged.

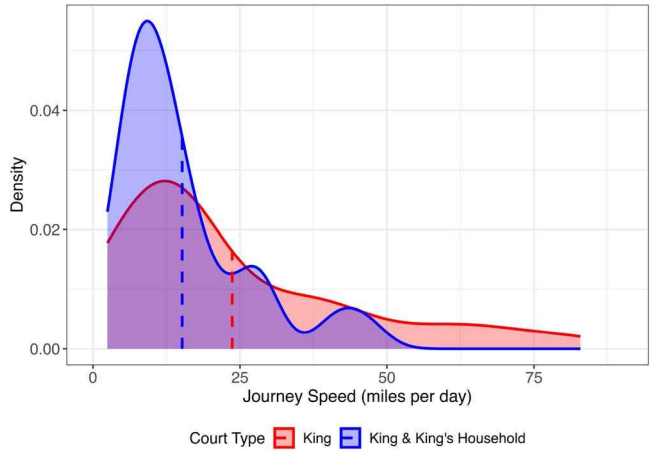

Figure 3. Density of journey speeds by court configuration, England and Wales, 1327–1345. *Note*: The dashed vertical lines represent the mean estimated travel speed of its respective group.

assumption but not a perfect one, we can distinguish days where the king is with the full government and when he is not.

Using the same process as above, I create 76 journeys during the early years of Edward III's reign—38 of which have the king travelling with the baggage train and 38 without. Figure 3 displays the distribution of journey speeds in England and Wales, distinguished by whether the king was with the household or not.

As expected, the king moved significantly faster when unencumbered by the household baggage train. His average travel speed without the baggage train is estimated at 24 miles per day, compared to just 15 miles per day when accompanied by it. When travelling with a smaller party, the king was capable of reaching speeds that were unattainable by the household baggage train. The maximum estimated speed for the king reaches 83 miles per day, a pace nearly double the highest estimate for journeys with the household, which tops out at 47 miles per day.

4.2 France, 1461–1589

I create 403 distinct journeys that the French king took within France from 1461 to 1589.[14] Figure 4 plots the 25-year moving average of non-winter, royal travel speed in France for both rivers and roads. The estimations are largely congruent, albeit slightly faster, with those discussed for England and Wales. The congruence gives credence to the method of journey construction and the resulting speed estimates.

As in England and Wales, the journeys in France exhibit a high level of variation in speed. Figure 4 also plots the distribution of travel speed, which were anywhere between 2 and 98 with a mean of about 20 mpd and a median of 15 mpd. The mean travel speed estimated here is slower than the 24 mpd estimated by Ludwig (1897) for continental Europe, as well

[14] Figure A2 plots the number of these journeys by decade.

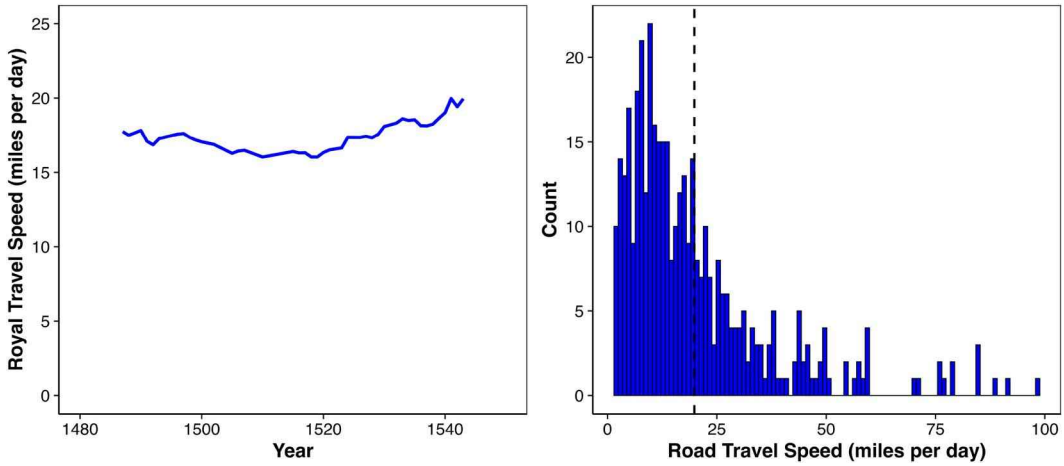

Figure 4. Royal travel speed in France. *Note*: The left panel shows the 25-year moving average of royal travel speed on roads. The right panel shows the distribution of recorded speeds.

as the 26 mpd estimate by Boyer (1951) for elite travellers with an entourage in 14th century France.

5. Comparisons to ordinary travellers

Boyer (1951) provides travel speeds along the road for various travellers by group type and reason for travel in 14th century France.[15] Travellers can be broken down into three main groups: those transmitting news or on urgent errands, individuals and small groups engaged in routine travel, and elites with an entourage in tow.[16] Table 2 provides her estimates of travel speed for the three different groups in 14th century France, as well as my estimates of travel speed discussed above.

The first observation worth highlighting is that Boyer's results for elites traveling with an entourage are considerably faster than my estimates. Boyer estimates elites to be traveling at an average of 26 mpd in 14th century France. Although a direct comparison is not possible here, my estimate of travel speed for elites traveling with an entourage in 14th century England and Wales is 17 mpd and 20 mpd for 15th century France. The discrepancy likely arises from the limited and non-representative nature of Boyer's sample of journeys. It is clear from her exposition that her goal is to inform the reader about the range of travel speeds, rather than to create a representative sample.

More importantly, Boyer's estimates allow for comparisons, however limited, between the estimates of royal travel speed in this paper and more ordinary medieval travel. Taken together as a class, individuals and small groups travelled 13 to 16 mpd faster than their more burdened elite counterparts. If one focuses on those travellers delivering news or engaged in urgent

[15] As far as I know, Boyer (1951) is the only source that estimates travel speeds for multiple types of traveller *and* provides direct information on the underlying sample.

[16] In Table A3, I reproduce the journeys and their associated speeds that are discussed in her article.

Table 2. *Average road travel speed in England and France by group size.*

Traveller	Country	Period	Road speed	Journeys	Source
Individuals/Small Groups	France	14th c.	33 mpd	31	Boyer (1951)
News/Errands	France	14th c.	41 mpd	12	Boyer (1951)
Others	France	14th c.	28 mpd	19	Boyer (1951)
Elite with Entourage	France	14th c.	26 mpd	14	Boyer (1951)
Elite with Entourage	France	1461–1589	20 mpd	403	This Paper
Elite with Entourage	England	14th c.	17 mpd	319	This Paper
King Edward III					
With Entourage	England	1327–1345	15 mpd	38	This Paper
Without Entourage	England	1327–1345	24 mpd	38	This Paper

Source: Boyer (1951) and Author's own estimates, rounded to the nearest whole number.

errands, the speed gap increases to 21 to 24 mpd. Thus, the "ordinary traveller" could, on average, travel somewhere between about 50% and 64% faster than the king of England and France and their baggage trains. However, if we focus on journeys where the king is not with the royal government, he is close to keeping pace with Boyer's travellers who were not on errands.[17]

But again, averages can be deceiving. The fastest road speed reported by Boyer is 52 mpd, which was achieved by a French royal courier on a round trip from Paris to Seignelay. Such a speed was well within the capabilities of the traveling monarchs. Boyer's data suggest that speed for individuals and small groups was less variable, but the small sample size makes it impossible to say anything definitive until more data is collected.

6. Potential determinants of royal travel speed

In an attempt to bring about some sense of regularity to the large variation in observed royal travel speeds I explore some potential determinants of travel speed using a standard OLS regression approach. In Sections 4 and 5, I established that group size had a large impact on travel speed, but even holding group size constant, the length of the journey, the traveller's characteristics, and the quality of the roads travelled all act to speed up or slow down travel. That such factors meaningfully determine travel speed is clear from the historical literature discussed above. The goal in this section is to get a basic sense of the potential magnitudes.

The major caveat is that the data presented in this paper is restricted to only observed royal journeys. The decision to undertake a journey and the choice of route reflect the king's expectations about the speed and feasibility of travel. For example, roads that were too poor or difficult to navigate would have been avoided altogether. As a result, the data likely omit journeys along the slowest or most difficult routes, leading to downward bias in estimated effects for any factor that impedes travel speed.

[17] My suspicion is that these speeds would equalize if both my sample of royal journeys separate from the entourage and Boyer's sample were larger.

Table 3. *Determinants of travel speed in Medieval Europe.*

Dependent Variable:	Journey Speed (miles per day)		
Model:	(1)	(2)	(3)
Constant	14.59***	24.92**	
	(2.077)	(10.79)	
Number of Travel Days	-0.0486***	-0.0810	-0.0494***
	(0.0144)	(0.1051)	(0.0155)
King's Age	0.2806***	0.0541	0.2524**
	(0.1042)	(0.5630)	(0.1112)
King's Age^2	-0.0047***	-0.0037	-0.0047***
	(0.0014)	(0.0073)	(0.0014)
Ruggedness (log)	-0.5410***	-0.7394**	-0.6397***
	(0.1566)	(0.3678)	(0.1797)
Soil Moisture (log)	-0.0004	-0.0225	0.0352
	(0.1705)	(0.4379)	(0.1677)
Winter	-0.8639	-0.2225	-0.6062
	(0.6021)	(2.195)	(0.6784)
War Year	3.194***	4.161**	3.419***
	(0.7193)	(1.906)	(0.7190)
Country Fixed Effect			✓
Observations	1,305	448	1,753
Squared Correlation	0.04475	0.03614	0.05333
Pseudo R^2	0.00606	0.00427	0.00688

Notes: Estimates of the effects of a number of variables on the travel speed of royal journeys in England and Wales and France. Robust standard errors are reported in parentheses. *Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 3 reports the estimated effect of a number of potential factors on royal travel speed. Column (1) corresponds to only the journeys of the English king in England and Wales, Column (2) for the French king in France, and Column (3) is both countries combined. In the discussion to follow, I rely on Column (3) as it incorporates both journeys in England and France.

We might expect longer journeys to be slower, whether due to fatigue or foresight about appropriate pacing. The length of the observed journey, in number of days, is negatively related to travel speed. However, the effect is quite small: Each additional day spent on a journey is associated with a 0.049 mile per day decrease in average travel speed.

Because we are studying royal travel, we might also expect qualities of the king and the reasons for which he might be traveling to affect his speed. We might expect that as the king grows older, and his stamina declines, his travel speed will slow. Travel speed rises with the king's age up to about 27, but beyond that the negative squared term implies declining speed, consistent with an inverted-U relationship between age and mobility. Warfare might also skew travel speed faster or slower. It might push travel speeds upward as the king rushes to the location of the battles or hurries around the kingdom looking for support. But we might also expect war to slow the king down given long days at the front or because he is with the army. The first channel seems to dominate empirically as a war occurring in the same year

as the journey is associated with faster travel.[18] Although all travellers likely felt the fatigue brought upon by age, the speed increase due to war is largely a product of studying a very particular traveller, and a reminder that we generalize with caution.

The quality of the road on which the king travelled was also an important determinant of travel speed. Soggy soil and rugged terrain would slow the king and his baggage train to a crawl. To proxy for road quality, I use the journey's total ruggedness[19] and the average moisture level of the soil along the journey.[20] The season, particularly whether it was winter, is also relevant. Winter weather would deteriorate the roads and the shorter days would limit distance travelled. Ruggedness is negatively correlated with travel speed as one would expect. The moisture of the soil along the journey and binary indicator for whether it was winter is statistically insignificant from zero, but likely for the reasons discussed above not because it is not an important determinant of travel speed.

7. Conclusion

The slow speed of travel is a fundamental fact about medieval Europe. But estimates of medieval travel speed are scarce. Those that do exist are based on few journeys and are often limited to a particular time and place. In this paper, I introduced new data on travel speed for England and Wales from 1199 to 1547, and for France from 1461 to 1589. I estimate average royal travel speed in England and Wales to be around 15 mpd, and in France to be around 20 mpd. But there is great variety in observed travel speed, ranging from 2 mpd to 81 mpd in England and Wales.

The traveller taken up for study in this paper is the itinerant monarch. Relying on the travels of kings allows for hundreds of journeys to be observed over multiple centuries. But in doing so, generalization must be made with caution. When it can be reasonably assumed that the king is not travelling with his baggage train, I find nearly a 10 mpd increase in speed. Relying on the limited extant data on the travel speed of ordinary travellers, I find taken ordinary travellers travelled between 13 to 16 mpd faster than the king with his entourage. But given the small sample size of speed estimates for ordinary travellers, cross-type comparisons remain suggestive until more data is collected down the road.

Conflicts of interest

None declared.

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[18] A war year is simply whether the kingdom is at war in a given year. No distinction is made between civil wars and international wars. The data on war years is sourced from Wikipedia.

[19] A journey's ruggedness is the total ruggedness of every stop along the journey. Ruggedness is sourced from Nunn & Puga (2012).

[20] To measure the moisture level of the soil I rely on the Old World Drought Atlas (OWDA), produced by Cook (2015) and Cook *et al.* (2015), which estimates the Palmer Drought Severity Index (PDSI) at the 0.5 × 0.5 degree grid-level. The PDSI represents spring-summer soil moisture conditions, and was reconstructed annualy using data on tree rings.

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Data availability

Data, code, and other replication files are available at Open ICPSR at https://doi.org/10.3886/E245927V1.

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Appendix: Additional tables and figures

A.1 Sources for royal itineraries

Table A1. *Sources for the Royal Itineraries*

Territory	Individual	Reign	Source
England	John	1199–1216	Kanter (2011b)
England	Henry III	1216–1272	Kanter (2011b); Craib (2013)
England	Edward I	1272–1307	Safford (1974); Kanter (2011b); Trabut-Cussac (1952)
England	Edward II	1307–1327	Hallam (1984); Hartshorne (1862)
England	Edward III	1327–1377	Ormrod (2012); Shenton (2007)
England	Richard II	1377–1399	Saul (1997)
England	Henry IV	1399–1413	Given-Wilson (2016)
England	Henry V	1413–1422	Mowat (1919)
England	Henry VI	1422–1461, 1470–1471	Wolffe (2001)
England	Edward IV	1461–1470, 1471–1483	Ashdown-Hill (2016 2017)
England	Richard III	1483–1485	Edwards (1983)
England	Henry VII	1485–1509	Temperley (1914); Powell (2018)
England	Henry VIII	1509–1547	Samman (1989); TNA OBS 1/1419
France	Louis XI	1461–1483	Bove & Plaquet (2016)
France	Charles VIII	1483–1498	Petit (1896)
France	Louis XII	1498–1515	Bove (2020)
France	Francis I	1515–1547	Zum *et al.* (2015)
France	Henry II	1547–1559	Zum & Kolk (2015)
France	Francis II	1559–1560	Zum & Kolk (2016)
France	Henry III	1565–1589	Zum *et al.* (2011)

Note: Where multiple citations are listed, the first listed citation serves as the main source of the individual's itinerary and the following citations are used to fill gaps. Due to gaps in the historical record, the years contained in the itinerary do not always include all years of the individual's reign. The territory corresponds to the dominant territorial dominion of the individual.

A.2 Additional figures

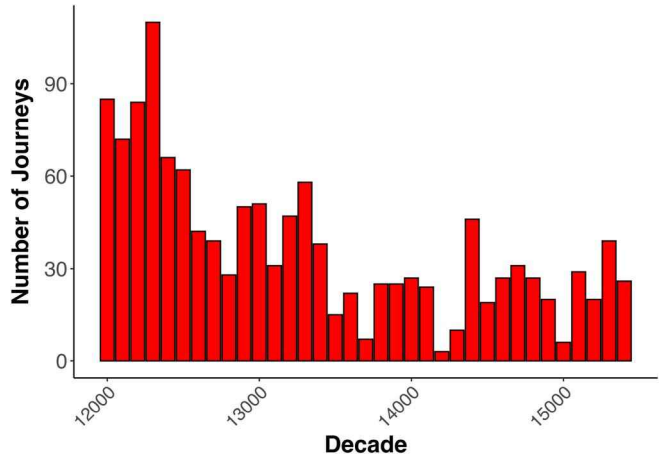


Figure A1. Number of journeys in England and Wales per decade

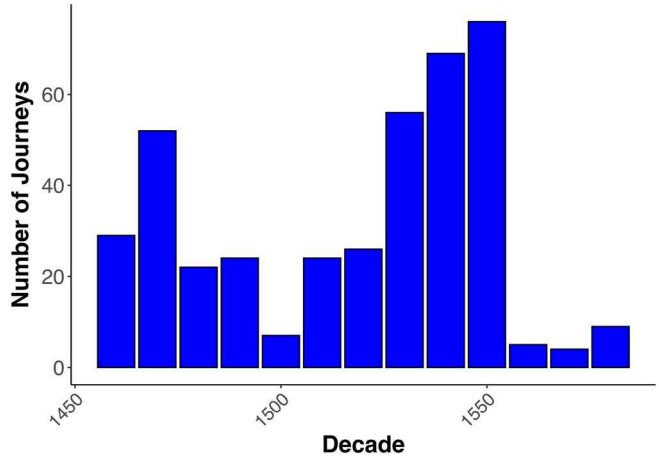
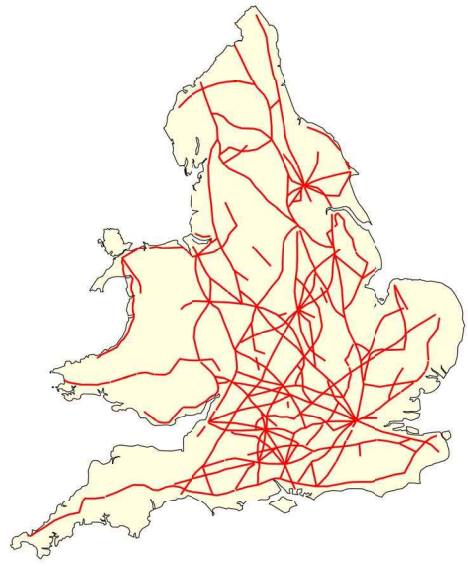
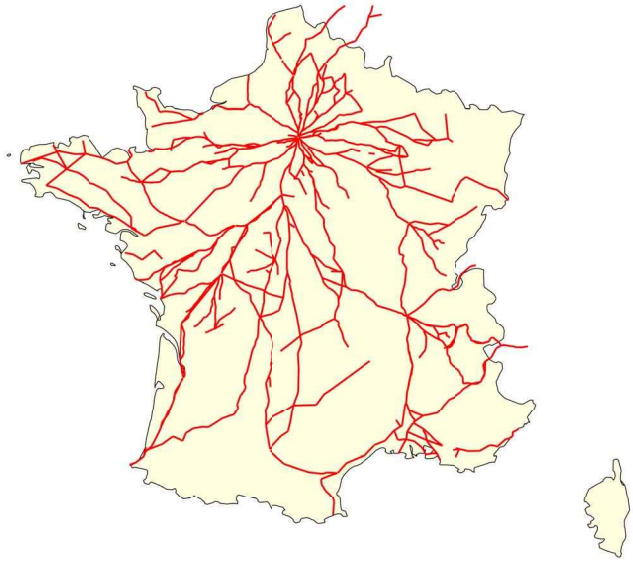


Figure A2. Number of journeys in France per decade



(a) England and Wales



(b) France

Figure A3. Medieval road networks in England, Wales, and France. *Notes*: Top panel shows medieval roads in England and Wales sourced from Hindle (1989). Bottom panel shows medieval roads in France sourced from Firnhaber-Baker & Owens (2021).

A.3 Summary statistics for the determinants of travel speed

Table A2. *Summary Statistics for the Determinants of Travel Speed*

Panel 1: England & Wales					
Statistic	N	Mean	St. Dev.	Min	Max
Journey Speed (miles per day)	1,436	15.5	10.5	1.9	81.0
Number of Travel Days	1,436	7.5	13.2	2	147
Average Soil Dryness	1,305	−0.4	1.9	−6.6	5.8
Winter	1,436	0.3	0.5	0	1
War Year	1,436	0.3	0.5	0	1
King's Age	1,436	37.1	13.4	10	67
Total Journey Ruggedness (log)	1,436	4.1	1.7	0.0	7.7
Panel 2: France					
Statistic	N	Mean	St. Dev.	Min	Max
Journey Speed (miles per day)	458	19.8	18.0	1.9	98.3
Number of Travel Days	458	4.9	6.0	2	56
Average Soil Dryness	448	−0.8	1.9	−7.7	4.1
Winter	458	0.2	0.4	0	1
War Year	458	0.7	0.5	0	1
King's Age	458	38.8	10.6	14	60
Total Journey Ruggedness (log)	458	5.1	2.5	0.0	8.6
Panel 3: England & Wales and France					
Statistic	N	Mean	St. Dev.	Min	Max
Journey Speed (miles per day)	1,894	16.6	12.9	1.9	98.3
Number of Travel Days	1,894	6.9	11.9	2	147
Average Soil Dryness	1,753	−0.5	1.9	−7.7	5.8
Winter	1,894	0.3	0.5	0	1
War Year	1,894	0.4	0.5	0	1
King's Age	1,894	37.5	12.8	10	67
Total Journey Ruggedness (log)	1,894	4.3	2.0	0.0	8.6

A.4 Journeys in Boyer's "A day's journey in medieval France"

Table A3. *Boyer's "A Day's Journey in Medieval France"*

Year	Traveller	Speed (mpd)	Type
1310	Emperor Henry VII	11	Elite with Entourage
1389	Valentie de Visconti	15	Elite with Entourage
1393	Henry, Earl of Derby	16	Elite with Entourage
1350	John II	19	Elite with Entourage
1389	Charles VI	20	Elite with Entourage
1315	Robert de Foilley	27	Elite with Entourage
1315	Count of Forez	31	Elite with Entourage
-	John II	31	Elite with Entourage
1395	Philip the Bold	22	Elite with Entourage
1395	Philip the Bold	25	Elite with Entourage
1368	Philip the Bold	29	Elite with Entourage
1396	Philip the Bold	30	Elite with Entourage
1364	Philip the Bold	37	Elite with Entourage
1389	Charles VI	45	Elite with Entourage
1345	Lieutenient of the Vicompte of Bayeux + 2	14	Individuals/Small Group
1380	Representative of Albi	15	Individuals/Small Group
-	Consuls of Albi	31.50	Individuals/Small Group
-	Consular of Rodez	36	Individuals/Small Group
-	Courier of Nevarre Court + 1	31	Individuals/Small Group
-	Pilgrims to Rome	28	Individuals/Small Group
1378	Representative of the Hotel-Dieu of Beavuais	31	Individuals/Small Group
1370s?	John Middleton + 1	31	Individuals/Small Group
1371	Pierre Scatisse	18	Individuals/Small Group
1372	Pierre Scatisse	23	Individuals/Small Group
-	Pierre Scatisse	22.50	Individuals/Small Group
1363	Raoul de Louppy	29	Individuals/Small Group
1316	Persons excorting packhorses with coronation supplies	29	Individuals/Small Group
-	Consul of Albi	30	Individuals/Small Group
1346	Treasury of Philip IV	32	Individuals/Small Group
-	Tax collectors party	33	Individuals/Small Group
1362	Inspector of mints	33	Individuals/Small Group
1362	Raoul de Louppy	33	Individuals/Small Group
-	Representative of Duke of Normandy	33	Individuals/Small Group
1369	Men from Albi (Letter carriers)	33	News/Errand
1336	Tax Collector's clerk	34	News/Errand
-	Persons sent from a town in regard to a subsidy	36	News/Errand
1373	Pierre Scatisse	34	News/Errand
1369	Pierre Scatisse	37	News/Errand
1370	Pierre Scatisse	42	News/Errand
1372	Pierre Scatisse	45	News/Errand
1396	Packhorse laden with urgent funds	49	News/Errand
-	Mounted man + man + packhorse	38	News/Errand
-	Tax collector of Lyon, Macen, and Chalon	40	News/Errand
1368	An individual escorting a messenger	47	News/Errand
-	Royal courier	52	News/Errand