

*Cpl. Salcott
with respects to S. M. S. M.*

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REPORT

OF THE

SURVEYS AND ESTIMATES

OF THE

LOUISVILLE AND CINCINNATI

BRANCH RAILROAD.

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LOUISVILLE, KY:

PRINTED BY JOHN P. MORTON & CO., 156 WEST MAIN STREET.

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REPORT OF CHAIRMAN OF THE EXECUTIVE COMMITTEE.



To the Stockholders of the Louisville & Frankfort and Lexington & Frankfort Railroad Companies:

GENTLEMEN: I submit to you herewith the reports of your Chief Engineer and Superintendent, touching the proposed Cincinnati Branch of your roads.

So soon as the necessary authority was granted by your acceptance of the amendments to your charters, the proper steps were taken to secure a thorough survey of the country lying between Louisville and Cincinnati, with a view to the selection of the best route for the Branch. These surveys have been made under the direction of I. M. St. John, Esq., an engineer of high distinction, and have just been completed. His report will furnish full information as to the different lines which have been run, and the probable cost of each.

Your Superintendent, Mr. Gill, after careful investigation, has prepared an estimate of the probable business of the road immediately after its completion.

In the preparation of these reports it has been our sole object to ascertain the value of the Branch as an investment of your means, and consequently we have sought the *truth* without regard to its possible effect upon the present prospects of the enterprise. The Chief Engineer was instructed to prepare a faithful estimate of the cost of the Branch, with all of its structures complete, and of the most permanent and substantial character; and the Superintendent's estimate of profits were directed to be made on so moderate a basis as to secure you against disappointment hereafter. These gentlemen heartily concurred in the propriety of the instructions given them, and have labored faithfully to present such estimates as may be

relied on with confidence by you. I have no hesitation in expressing my own conviction of the fidelity and completeness with which their work has been done.

PUBLIC IMPORTANCE OF THE WORK.

More than 300,000 passengers and 500,000 tons of freight are now annually carried between the cities of Louisville and Cincinnati. Their transportation is effected by steamboats (of which three leave each city daily, in addition to the transient boats), the distance being 144 miles, and the time occupied twelve to fifteen hours, or by railroad, via Seymour, the distance being 136 miles, and the time occupied nine hours. The construction of our Branch will shorten the distance, according to the route selected, to 104 or 107 miles, and the time to four hours. In connection with the Nashville Railroad, we will offer to the city of Cincinnati a line to Nashville shorter by twenty miles than any which can be obtained by the extension of the Kentucky Central through Lexington and Nicholasville; and, via the Memphis Branch of the Nashville Railroad, a line to Memphis eighty-five miles shorter in distance and six hours in time than the route now traveled by Sandoval, Cairo, and Columbus. The distance by river from Cincinnati to Memphis is nearly twice as great as by our road, and under the most favorable circumstances the transit will occupy nearly three times as many hours. Obviously the extension of the commerce of Cincinnati must be sought for in the South-west. Her Central Kentucky line, if extended in a southerly direction, will traverse an unproductive region until it passes the Cumberland Mountains, when it will come into competition with the lines leading to the seaboard; and, via the Atlantic, with the markets of Europe and the Eastern States. But the commerce of the South-west is peculiarly the property of the cities of the Mississippi Valley. From its starting point our road will traverse a rich and productive region, and its connections will pierce the center of the South-west. On the other hand, it will shorten the distance and time between Louisville and the North-east, while it will guard her against the danger of a diversion of

the South-western trade by the construction of new lines in the interior. It is unnecessary to allude to the importance of the Branch to its local population—this is too plain to require discussion here.

COST OF THE BRANCH ROAD.

The report of the Chief Engineer furnishes in detail the estimated cost of each of the routes which have been surveyed, including the cost of depots, water stations, machine-shops, ballasting, and equipment of every kind, together with the cost of such improvement of the present road between Louisville and the junction of the Branch, as is deemed necessary to make it in every respect a first-class road. It will not be necessary, however, to incur the whole of the estimated expenditure in order to put the Branch in operation. At several points on each route there are heavy embankments, in the construction of which trestle bridges will be necessary, even if it be designed to carry to immediate completion the permanent works they are intended to aid; and the cost of such trestles is included in the estimates. By making the trestles of a more substantial character, which would add but little to their estimated cost, they may be made to answer all your purposes for several years to come, and until it shall be found convenient to replace them by embankment or permanent bridges. The ballasting, which is estimated at \$2,500 per mile for the whole length of the Branch, will not be needed for, and ought not to be placed on, the embankments until they are thoroughly settled by time and the passage of trains. The whole equipment estimated for will not be at once required. The improvement of the present road between Louisville and the junction of the Branch may also be deferred until the finances of the company shall be in such condition as to justify it. An additional estimate of the *first cost*, or amount necessary to put the line in operation upon either route, is therefore given in the report of the Chief Engineer. A general summary of the result will facilitate its comprehension. It will be observed that a separate estimate is made for the termination of each route in West Covington, South Cov-

ington, or Newport; the point of departure in each case being one mile distant from the suspension bridge across the Ohio River. It will answer my present purpose to take an average of the estimates for each of the principal routes—the difference due to the particular termination being comparatively inconsiderable. The result is as follows:

DESIGNATION OF ROUTE.	First cost.....	Ultimate cost.	Distance in miles.....
Route No. 1, A, via La Grange and Carrollton.....	\$3,799,360	\$4,157,385	110.00
“ No. 1, B, “ “ “ “	3,848,186	4,206,211	108.63
“ No. 2, A, “ “ “ Eagle Creek....	3,579,681	4,042,298	105.10
“ No. 2, B, “ “ “ “	3,941,519	4,404,166	103.53
“ No. 2, C, “ “ “ “	3,751,461	4,227,412	105.18
“ No. 3, A, “ Smithfield and “	3,455,425	4,375,820	106.31
“ No. 3, B, “ “ “ “	3,975,514	4,905,306	102.44
“ No. 3, C, “ “ “ “	3,661,063	4,600,839	104.03
“ No. 4, A, “ Eminence and “	3,611,742	4,632,856	104.30
“ No. 5, A, “ Pleasureville and Six-mile Creek	3,645,436	4,674,743	111.36

The cost and length of the last-named line may be somewhat reduced by further examination of the ground west of Pleasureville. The near agreement in the *first cost* of these lines is very remarkable. The difference between the *first* and *ultimate* cost increases very rapidly as the point of junction of the Branch with the present road is removed further to the eastward, because of the greater change in the location of the present road; but it is compensated (1) by the shortening of the distance between Louisville and Lexington, and (2) by the still greater shortening of the distance between Cincinnati and all points upon the present road east of the junction, and consequently by the increased economy of working the present road, and its increased ability to compete for that portion of the interior trade which seeks Cincinnati as a market. The thorough character and great extent of the surveys have caused the time of the engineers to be fully occupied since the commencement of their labors to the date of this report; but even had time permitted, prudential reasons of the most obvious character would have forbidden for the present a final comparison of the relative advantages of the different routes. Such a comparison should

only precede the actual location of the Branch, and can be made from the data now in our possession whenever it shall become necessary.

MEANS WITH WHICH TO BUILD IT.

The amendment to your charters, which authorizes the construction of the Branch, empowers the two Companies to issue their joint bonds to the extent of three millions of dollars, and to secure the payment of both principal and interest by a mortgage of the entire franchises and property of both Companies, including as well their present roads as the proposed Branch; and, in addition, to issue and sell new shares to the amount of one million of dollars. The proceeds of the sales of these securities will enable us to put the line in operation.

The present liabilities of the two Companies are as follows:

LOUISVILLE AND FRANKFORT RAILROAD CO.

To State of Kentucky.....	\$74,519 50
Railroad Bonds.....	145,000 00
Louisville City Bonds.....	100,000 00
Total.....	\$319,519 50

LEXINGTON AND FRANKFORT RAILROAD CO.

To Bonds 1869 and 1874.....	\$79,000
Less Sinking Fund on hand.....	10,000
	\$69,000 00
Total debt of the two Companies.....	\$388,519 50

The indebtedness of the Louisville and Frankfort Railroad Company to the State of Kentucky is a perpetual loan, on which interest at the rate of six per cent. per annum is payable whenever dividends are paid to the stockholders, but does not constitute a lien upon the road. The entire mortgage debt of the two Companies is therefore \$314,000 only. Neither Company has for several years had any floating debt.

The cost of their roads from Louisville to Lexington, a distance of ninety-four miles, was \$2,190,243.36, and the net income of the two Companies (including the sums expended for branch surveys and improvements beyond repairs) for the past

year was \$169,214.79, and the average net income of the eight preceding years was \$166,214.16.

The new mortgage, so far as concerns the existing roads, would therefore be subject to a prior lien of \$315,000, but would constitute a first lien on the eighty miles of Branch. The money arising from the sale of bonds would of course be applicable to no other purpose than the construction of the Branch, and as its payment would be needed 'only a little in advance of the progress of the work, the increase in value of the security to the bondholders would keep pace with the requisitions made upon them. Upon the completion of the Branch the mortgage debt would amount to \$3,315,000, for which there would be pledged as security over one hundred and seventy miles of road.

As the issue of the new shares is intended principally to provide for the equipment, it will be neither necessary nor desirable to attempt their sale until the roadway itself shall be practically complete, and the success of the enterprise thus placed beyond all cavil. I recommend that, at the ensuing session of the Legislature authority be obtained to constitute the new shares a *preferred* stock, with a guaranteed dividend of eight per cent. per annum. The suggestion is made not from any apprehension of inability to negotiate the common stock of the Company, but from the conviction that this will be the cheapest mode of raising the money; for the guaranteed dividend will make the new shares a desirable security to those who seek a safe and permanent investment—while the profits of the common stock can hardly fail to be much larger than the guaranteed dividend.

The amendment to your charter authorizes each of the cities of Louisville, Covington, and Newport to aid in the construction of the Branch by a subscription for the purchase of your bonds to the extent of \$250,000; and the counties of Jefferson, Oldham, Henry, Kenton, and Campbell, each to subscribe for \$150,000 of bonds for the same purpose. In consequence of the objections of their senators, no similar authority was granted by the Legislature to the counties of Gallatin, Boone, Grant, Owen, Trimble, or Carroll. In view of the immense

advantages to be derived by them from the construction of the Branch, the safety of the investment, and the ease with which a location may be made upon any one of the several routes which may be able to offer the largest inducement in subscription, it is not doubted that the opposition of these counties will not only be withdrawn, but converted into an application for authority to subscribe, at the approaching session of the Legislature. We have assurance of aid from connecting roads. The high standing and credit of your Companies will enable us to dispose of a considerable amount of your securities to individuals at home. It is confidently believed that a sufficient amount of money can be obtained from these local sources to enable us to prepare the road-bed, and leave it necessary to negotiate abroad for the superstructure and equipment only.

ESTIMATE OF THE BUSINESS OF THE BRANCH.

The receipts of the Branch, including the increase in the receipts of that portion of your present road lying between Louisville and the junction which will be due to its construction, are estimated by Mr. Gill at \$1,250,000 per annum, which is at the rate of about \$12,000 per mile of road. Fifteen years' experience in the management of your roads have fully qualified him for the preparation of such an estimate. My own confidence in the general moderation and correctness of his views is strengthened in the present instance by the following reflections:

1. The receipts of the main line of the Louisville and Nashville Road, for the year ending July 1, 1866, were at the rate of \$15,550 per mile of road. Those of the Cincinnati, Hamilton and Dayton Railroad, for twelve months preceding their last report, were at the rate of \$22,578 per mile; and those of the Little Miami, including in the average thirty-three miles of comparatively unprofitable branches, were \$15,900 per mile. Our road, having for its termini two of our most important commercial cities, will connect, by the shortest practicable line, the Nashville with the Cincinnati lines; and yet the estimate of its business is for less than 75 per cent. of the actual receipts of

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the Nashville, and less than 60 per cent. of those of the Dayton, or the probable receipts of the main line of the Little Miami.

2. The country traversed by or adjacent to the line is already populous and productive. The counties of Jefferson, Oldham, Henry, Trimble, Carroll, Gallatin, Owen, Grant, Boone, Kenton, and Campbell embrace an area of 1,274,500 acres of land, of which, according to the census of 1860, 776,592 were improved, and 497,938 were unimproved. The aggregate value of the lands was \$39,288,562; and the average, ranging from \$12 per acre in Owen to \$65 per acre in Jefferson, was about \$31 per acre.

The aggregate wealth of the same counties in 1865, as reported by the Auditor of State, was \$102,662,827. Among their principal productions of the same year are enumerated—of tobacco, 5,754,045 pounds; hay, 35,335 tons; Indian corn, 3,826,445 bushels; and wheat, 520,705 bushels. The number of white males over 21 years of age was 38,956, representing a total population of more than 230,000 souls.

There can be no doubt that the construction of our Branch, by increasing the facilities of access to these counties, every portion of which will be brought within a ride of 2 hours from Louisville or Cincinnati, will cause a rapid and great increase in their population and production. The estimate of Mr. Gill has reference to the present condition of the country, without regard to its certain development in the near future.

The net earnings of the line are estimated by Mr. Gill at\$549,600
which is equal to 12.21 per cent. on a cost of \$4,500,000. Assuming
that sum as the ultimate cost of the Branch, we would have to deduct the following:

1. Annual interest on \$3,500,000 of debt	\$245,000
2. Dividend on \$1,000,000 preferred stock	80,000
3. Annual appropriation to Sinking Fund	50,000
	375,000
Balance for division between the two Companies.....	\$174,600

The business of your present roads would at the same time be increased by the flow of passengers and freights from points above to the junction of the Branch, on their way to Cincinnati. Without attempting any estimate of such increase, but assum-

ing simply a continuance of the profits of the past year, we have the following result:

Net income of Lou. & Frank. and Lex. & Frank. Railroads for past year (including expenditures for Branch surveys, and permanent improvements beyond repairs).....	\$169,214 79
Add estimated profits of the Branch, as above	174,600 00
Total profits on completion of the Branch	\$343,814 79
From which deduct interest on the present debt of the two Co's.....	23,311 14
Would leave for division among the Stockholders.....	\$320,503 65
which is 19.7 per cent. on \$1,625,000, the entire capital stock of the two Companies.	

At first sight these anticipations may seem extravagant, but a little reflection will satisfy any one that they are within the bounds of reason, and attributable: 1. To the intrinsic advantages of our location; 2. To the fact that we have already in operation more than one fourth of the whole line from Louisville to Cincinnati; and 3. To the comparatively small amount of the liabilities of your Companies, the capital stock and bonds of both, amounting to only \$2,012,000, or about \$21,400 per mile for your existing roads.

CONCLUDING REMARKS.

Before any negotiation of the securities of the Companies could be seriously undertaken, it was necessary that the surveys and estimates should be completed. Until this was done your Boards were without the information necessary to determine whether the prospects of the enterprise were such as to justify them in entering upon it; nor could capitalists be expected to entertain propositions for furnishing means to a work of unknown character and extent. It is believed that the accompanying reports will supply all that is required for both purposes.

The delay thus necessarily occasioned is the less to be regretted, as the financial disturbance abroad would of itself have probably prevented the success of any attempt at negotiation during the past half year; and there is good reason to hope that it may be more than compensated for in a decline of prices,

which will result in a material reduction of the cost of the work, the estimates for which are all made at the present high rates of both labor and materials.

The close competition between several of the routes which have been surveyed will require a careful summary of the advantages of each before a final location is made. The landholders along these lines are aware that the cost of right of way may constitute a material element in the consideration of this question, and on several of them a commendable spirit has been already shown in the relinquishment of the right of way without charge to the Companies. When the report of the Chief Engineer shall have demonstrated the freedom with which we may make our selection among the several routes, a prudent regard for their own interests will compel similar relinquishments from those who have been less prompt heretofore. The expenditure on this account may be expected to be very inconsiderable, except in the vicinity of Covington or Newport, and is included in the estimate for depots, water stations, and right of way.

The present value of your property and franchises is too great to be hazarded in any speculative undertaking, however great its promise in the event of success. The prudence which has heretofore characterized the management of your interests by your several Boards may be relied on as forbidding them to embark your resources in the construction of the Branch until their ability to complete it with the means at their command is demonstrated beyond reasonable question.

All of which is respectfully submitted.

W. A. DUDLEY,

Chairman Ex. Com.

LOUISVILLE, Aug. 25, 1866.

ESTIMATE OF EARNINGS AND EXPENSES.

SUPERINTENDENT'S OFFICE, }
LOUISVILLE, KY., July, 1866. }

W. A. DUDLEY, Esq, *Chairman of the Executive Committee:*

SIR: Herewith I present an estimate of the probable earnings and expenses of operation of the Cincinnati Branch Road, with some explanatory remarks.

THROUGH TRAVEL.

All business passing over the whole line is regarded as "through," whether arising at the terminal points or beyond them. With the view of arriving at a correct estimate of the travel actually passing between these points, prominent railway officials at Cincinnati and Louisville, who are familiar with the statistics of railway and steamboat travel, were consulted. An actual enumeration also of the persons transported by the regular steamboats, of which there are three daily each way, have been frequently made during the past four or five months, from which I learn that not less than eight hundred persons have been actually passing between Louisville and Cincinnati. Upon the completion of the direct rail line, in the course of the month of August, via Clarksville, from Louisville to Memphis, an addition of one hundred per day may be relied upon, so that in a few months not less than 900 persons daily, by river and rail, will be passing between Louisville and Cincinnati, and to places beyond them. The question arises, what portion of this travel can be controlled by the Branch Road? I entertain no doubt that *all* of the travel which is local to, or arises and terminates at, Louisville and Cincinnati, will be diverted to this

line, for it is not believed that a road well constructed, thoroughly ballasted, and equipped with locomotives and cars of the most approved styles, with three daily trains, making the run in three and a half to four hours, will not be preferred to steamboats, making the trip in ten to fifteen hours. There is no existing rail line that can compete with it, and as it will occupy the shortest practicable route between Louisville and Cincinnati, none is likely to be built until a vastly larger local population demands additional facilities.

It is also believed that a large portion of the travel passing to and from the south and south-west of Louisville to Cincinnati, and places east and west of it, will seek this road, as it will form a link in one unbroken line from Cincinnati to Memphis, over which passengers can be transported, without being subjected to the inconveniences of change of cars, in many hours less time than by any other route. Passengers from Memphis and New Orleans can not but appreciate a line where only one change of cars would take place between Memphis and New York.

Of the 900 passengers daily passing over the routes referred to above, I estimate that two thirds will take this line. The completion of the road, by multiplying facilities, will rapidly increase the travel between the two cities, and ensure a much larger amount of business than is estimated for under this head.

THROUGH FREIGHT.

From the information derived from the Board of Trade in Louisville, where a record is kept of the trade of the city, from the agents of the steamboat and railroad lines in Cincinnati, and from the statistics of the Louisville and Nashville Railroad, I learn that not less than one million of tons annually of articles of produce and manufacture are interchanged between the sections of country, for the trade of which this Branch road can compete.

The location of your track near the principal pork-packing establishments of Louisville, and the convenience of access of your depots to the heart of business centers in both Cincinnati

and Louisville, will place the road in the most favorable position to secure a fair proportion of that freight which passes between the two cities. In times of low water, and when the river is frozen up, your road will be the only available line.

For that large traffic between Cincinnati and Nashville, Clarksville, Memphis, Chattanooga, Atlanta, and all the interior South, your road will offer unrivaled facilities for its rapid transfer, without change of bulk, several days in advance of any river or rail line. In view of the immense tonnage to be moved, and the advantages offered by your line, the estimate for through freight I consider far within the margin of safety.

LOCAL TRAFFIC.

I have estimated for local passengers a very much less number than has actually been transported annually by the Louisville and Lexington roads for many years past. When we consider that the Branch road passes through a country nearly as thickly populated with whites as that along the present roads, with five or six macadamized roads crossing it at convenient intervals, bringing a large section within easy access, and the quickening impulse which will be given along a road between two such large cities, I must regard the estimate as within the probable immediate results. The local freight traffic is placed at about that of our present roads. In addition to what will arise along the road itself, a very considerable portion of the small grain which seeks a Cincinnati and eastern market, from Fayette, Woodford, Scott, Franklin, and Shelby, will be transported over the present roads to the Branch junction, and thence via the Branch to Cincinnati without change of cars. Many of the heavy cattle, sheep, and hogs of the same counties for the same markets, will swell the receipts of the Louisville and Lexington road, and contribute to those of the Branch.

The express receipts are based upon information from the express officers.

After careful consideration of these estimates, I feel entire confidence that they will be more than realized after the first year's operation.

OPERATING EXPENSES.

Three through trains each way daily, and a local train running out thirty miles from Cincinnati, are estimated as required to do the passenger business. Two freight trains each way daily, and a local freight train every other day will, be necessary in performing the freight business. These trains are in addition to those now running on the Louisville and Lexington road, but an adjustment of the running time of the trains between Louisville and the junction can in all probability be so made as to reduce the expense of operation below these estimates.

I have calculated the number of miles to be run by these trains, and the necessary wood and ballast trains, and estimated their cost at the same rates as the cost of mileage upon the Louisville and Lexington road at the present time. We may expect that the cost of operation will diminish as prices of labor and materials approach the gold standard.

In conclusion, allow me to remark that I doubt whether any railroad enterprise was ever projected in this country where the amount of business to be received immediately upon its completion was of so certain calculation, and one that promises to stockholders such large returns upon their investment.

Respectfully,

SAMUEL GILL,
Superintendent.

**Estimate of the probable Earnings and Operating Expenditures of
the Louisville and Cincinnati Branch Railroad.**

EARNINGS.		
Through passengers, 220,000 at \$3	\$660,000 00	
Way passengers, 150,000 at 80 cents.....	120,000 00	
		\$780,000 00
Express.....	\$50,000 00	
Mails	20,000 00	
		70,000 00
Through freights, 100,000 tons at \$2.50	\$250,000 00	
Way freights, 50,000 tons at \$3.....	150,000 00	
		\$400,000 00
		\$1,250,000 00
EXPENDITURES.		
Passenger trains	237,000 miles.	
Freight trains	150,000 "	
Wood and ballast trains.....	25,000 "	
Total mileage.....	412,000 at \$1.70	\$700,400 00
Net earnings.....		\$549,600 00

CHIEF ENGINEER'S REPORT.



LOUISVILLE, AUGUST 1, 1866.

WM. A. DUDLEY, ESQ., *Chairman of Executive Committee.*

SIR: The report of the surveys of the Louisville and Cincinnati Branch Railroad is herewith respectfully submitted, together with the maps, profiles, and estimates of cost for the several routes examined.

Under instructions to determine by instrumental survey the shortest and, with due regard to local trade, the best branch connection, "with Covington and Newport as termini, from some point on the Louisville, Frankfort and Lexington Railroad east of Lagrange," the surveys were commenced in March last with two field parties, and were pressed sufficiently to permit the advertisement of work upon a selected line in June last had the commencement of construction been deemed essential at that time. The monetary derangement, however, intervening, advantage was taken of the delay to make a more patient and careful examination of the several competing routes which have been urged upon the Company, to secure the largest local trade without undue sacrifice of the leading objects of the enterprise. Five principal routes have thus been instrumentally examined, and they are now reported upon, together with all such connecting lines as are deemed necessary to the full consideration of all useful and practicable combinations of the main routes. The Company will thus be enabled to use to the best advantage the singular competition of routes which the survey has disclosed.

1. OF THE FIELD OF SURVEY.—By reference to the accompanying map it will be seen by those not familiar with the country that an air line from Louisville to Cincinnati crosses the Ohio River three times, and is therefore impracticable for the

immediate base of a railroad location. It will also be observed that the closest approach to an air line lies south of the Ohio, and must hold either a portion of the valley of that river or of the parallel valley of Eagle Creek, the largest tributary of the Kentucky River. This important topographical advantage is further increased by the great bends of the Ohio River at Lawrenceburg, Patriot, and Madison, which combine with the unfavorable character of the interior country to protect the Kentucky route from serious competition in the future. This fact is made more apparent by the result of the late surveys for the Lawrenceburg and Madison route from Cincinnati to New Albany in giving a through distance of $128\frac{8}{10}$ miles, or an excess of nearly one fifth of the entire distance as compared with the average of the present surveys. The distance by the more northern route, via Seymour, is of course greater still; viz.: 136 miles.

It will be further observed that the general direction of the Louisville and Lexington Railroad for nearly thirty miles north-east from Louisville approaches closely that of a direct connection with Cincinnati. It also occupies on the gradually ascending ridge between the waters of the Ohio and Salt Rivers very desirable ground for a railroad location up to the high rolling country of Oldham, Trimble, and Henry Counties, which must be encountered alike by all direct routes from Louisville to Cincinnati. The plateau in question averages in height from 500 to 550 feet above Ohio low water, and this elevation is held to the Kentucky River bluffs. The descent to the Kentucky thus becomes a controlling point of the location, and will determine the maximum grade of the road. From the Ohio River up to Lockport, which bounds the survey on the south, there are but six valleys of sufficient length to secure the required descent within the limit of grade deemed admissible for a railroad of the character of that projected. These are the Little Kentucky, Mill Creek, Gullion's Branch, Cane Run, Drennon Creek and Six-mile Creek. With the exception of the last (and that approximately), each has been carefully tested by instrumental survey.

The Kentucky River crosses the field of survey midway between the termini and nearly at right angles to the general direction. It affords peculiar facilities for access to the work under construction, and its extensive and very abundant valley will be an important feeder to the road when completed, by whichever route located, the several lines embracing its most productive portions. In their bridge crossings no unusual obstacles are encountered for a stream of its size and character. The water way required will be from 500 to 600 feet, according to the crossing, and with favorable approaches to the bridge-head on all but one of the routes.

East of the Kentucky River similar topographical features are presented with those west, the general surface of the country being high, rolling, and frequently broken by the valleys of the more important creeks and their branches. These valleys, however, are much more favorable in direction than in the western division, and afford much lighter grading, with occasional long stretches of easy bottom work. Toward the head of these streams, and ascending the ridge dividing the Licking waters from those of the Kentucky and Ohio, the valleys become somewhat more winding, the ground more broken, and the work thereby required in graduation proportionately more heavy. In passing the ridge, however, it is not found necessary to exceed the maximum gradient of the western division, and both ridge and valley locations can be readily secured to either terminus, Covington or Newport.

The prevailing rocks of the region west of the Kentucky are of the fossiliferous limestone series, running down occasionally to the hard blue limestone. The rock lines lie generally from 8 to 13 feet below the ground surface. This limits the depth of cutting somewhat disadvantageously in arranging the secondary grades of the location, but compensates in a material degree by supplying good rock foundations in nearly all the bridge and culvert sites of the interior lines, and good quarry-stone within reasonable haul. The abundance of riprap and ballast stone is a notable feature of almost all the lines surveyed. For tunnel work the surface indications promise a rock

at least as firm as the Frankfort Tunnel, on the Louisville and Lexington Railroad, which in seventeen years has not been found to require arching. Still I have deemed it prudent to estimate for all reasonable contingencies in this particular.

East of the Kentucky River the limestone formation still continues, but the rock lies generally deeper, and near Covington it is apparently softer and more easily worked.

The natural acclivity of the more difficult portions of the country thus indicated is found to suggest maximum gradients of sixty and sixty-six feet per mile, according to the route elected. Upon nearly all of the lines the lower gradients named can be held without undue cost as compared with the amount and character of work now generally accepted upon first-class roads. Sixty feet per mile is also less than the maximum gradients of the railroads directly connecting, and much less than those of the more distant roads which contribute so largely to the south-western travel through Louisville and Cincinnati—the Pennsylvania Central, the Baltimore and Ohio, and the Central Ohio.* It is evident from the position of the controlling points on the profile (the Kentucky and Licking ridges and the Kentucky River valley) that the maximum gradients can not be advantageously grouped for assistant power. It is consequently the interest of the company, although the principal business of their road is to be passenger and first-class freight, to adopt for construction the lowest attainable gradient within reasonable cost.

In curvature, the maximum now generally adopted for the later American roads—viz.: six degrees (6°)—can be used with facility.

In determining the character of bridges and other works of construction, I have been materially disembarassed by your instructions “to survey and estimate for a first-class railroad between two leading cities.” This has been done. And it may be pertinent here to state that before committing the company

*The maximum grade of the Baltimore and Ohio Railroad is 117 feet per mile.
The maximum grade of the Pennsylvania Central Railroad is 92 feet per mile.
The maximum grade of the Ohio Central Railroad is 83 feet per mile.
The maximum grade of the Louisville and Nashville Railroad is $71\frac{1}{2}$ feet mile.

to what some might deem an undue expenditure of capital in saving distance, the engineer first submitted to the proper officers his estimate of the limit of cost to be encountered in reducing circuits; and this estimate having been accepted, has guided the location of the lines reported.

With this explanation I proceed to the description of the respective routes, it being borne in mind that between Louisville and each point of proposed divergence from the Louisville and Lexington Railroad, the old track can be advantageously straightened.*

ROUTE No. 1, VIA LA GRANGE, CARROLLTON, THE OHIO RIVER, AND GUNPOWDER CREEK.—This line leaves the Louisville and Lexington Railroad about three thousand feet east of the La Grange depot, and bearing slightly from its course to turn several branches of Harrod's Creek, crosses that creek on a favorable bridge site on the farm of Wm. Smith, one and three fourth miles from the point of divergence; thence, ascending the slopes of Indian Run, it crosses the Little Kentucky Ridge near the house of Mrs. Pendleton, and, descending the slopes of that creek one and one fourth miles to its low grounds, intersects (five and three fourths miles below) the line surveyed for the Louisville and Covington Railroad in 1852, and about two miles below the Patton Creek Tunnel of that location. From this intersection, nearly fifteen miles down to Carrollton, the line of '52 was carefully retraced to verify the profiles which had been placed at the disposal of the company by the President of the old Louisville and Covington Company. The result was so satisfactory as to permit the use of these profiles in estimating for the river route so far as its eastern intersection with the present surveys east of Florence. Thence into Ludlow and Covington these surveys, holding more favorable ground, have been used.

A cut-off line from La Grange to the Little Kentucky has been examined, crossing Harrod's Creek on the Ballard farm,

*On the La Grange routes, the distance from Louisville to La Grange can be reduced at least $1\frac{1}{4}$ miles by straightening the present track; and within a reasonable limit of cost, provided the right of way is conceded, as it has been done upon the straightened line by Floyd's Fork to Eminence and Smithfield. Otherwise, the La Grange distances, as stated in the report, will be correspondingly increased.

and the Little Kentucky Ridge near Sligo, by which a saving of distance of $1\frac{6}{10}$ miles can be had, but with increased cost.

Down the Little Kentucky the grading is light, but from its numerous and sharp bends the stream must be bridged eight times with spans increasing from 100 to 150 feet, and the embankments will require constant riprap protection. Good stone is convenient.

From the Little Kentucky the line turns the spur of the dividing ridge, and crosses the Kentucky River at Prestonville, in line with the main street of Carrollton. The water way originally estimated for this bridge (450 feet) must be increased to 600 feet, and the estimate has been made accordingly. Pile, or the more expensive character of crib foundations, will be required, and in deep water. Good quarries are accessible by land and water.

From Carrollton, $17\frac{1}{2}$ miles to Warsaw, and passing Ghent midway, the gradients are as favorable as could be desired; and beyond to the mouth of Gunpowder Creek the grading is light, but with high masonry at all bridge crossings. At the mouth of Sugar and Big Bone Creeks the south bank of the Ohio is wearing rapidly, and at the former serious landslides have commenced in the bluff slopes, for which allowance has been made in the estimate. These difficulties have been exaggerated by popular report. The excavation necessary to open the road can be made without excessive first cost, and the river embankment can be securely riprapped. This section of the finished road will always require close attention, and will be expensive to keep in perfect running order.

At the mouth of Gunpowder Creek the line leaves the Ohio River, and with generally favorable graduation ascends its slopes, after passing Riddle's Run, with a gradient of $52\frac{8}{10}$ per mile, and crossing the Florence Ridge at the head-waters of Dry Run, passes down, with a 60-foot gradient on the slopes of Pleasant Run, to the banks of the Ohio, near Ludlow, touching the west corporation line of Covington 1 mile from the Ohio Suspension Bridge, and directly opposite the depots of the Atlantic and Great Western, Hamilton and Dayton, Indian-

apolis, and Ohio and Mississippi Railroads. On the last six miles down Pleasant Run occurs the heaviest grading of the line. Cross-tie timber is not abundant east of Carrollton.

Carrollton, Warsaw, and Ghent are thriving river towns, and points of shipment for a considerable extent of back country, with which communication is held by the Kentucky River and good macademized turnpikes. The farms along the river division of this route lie in a narrow and very fertile belt,* and from present indications the adjustment of the right of way will cost much more than on the interior routes, upon the larger portion of which relinquishments of right of way have been tendered to the Company without charge. Their products, however, especially in bulk, will naturally continue to use river transportation. The ridge country from Gunpowder eastward is productive and well improved, and will supply a good way business into Cincinnati.

The shortest distance from Louisville via La Grange and the Ohio River to Covington is $108\frac{63}{100}$ miles. The through distance by the surveys of '52 via Patton's Creek, Carrollton, Ohio River, and Gunpowder Creek are given as follows on the profiles of the old Louisville and Covington Railroad:

Louisville to mouth of Patton's Creek.....	29.73
Mouth of Patton's Creek to Carrollton.....	20.56
Carrollton to Riddle's Run, on Gunpowder.....	34.28
Riddle's Run to Main Street, Covington.....	24.39
	<hr/>
	108.95
Deduct probable saving by relocating middle fork of Gunpowder Creek	1.35
	<hr/>
† Total distance	107.60

The most favorable features of the river route are its easy gradients and generally light work, as indicated in the following tables of comparative distance and cost, and the thickly settled character of the country directly adjacent for way passenger business. Its unfavorable features are the high masonry necessitated by the high water of the Ohio, a more difficult

*Since the above was written, application has been made to the company by leading parties on the river route for relinquishment forms for the right of way. The cost of this item, as estimated, may, in consequence, be reduced.

† It is proper to add that the President, Mr. Henderson, states his impression that the through distance had been or could be reduced to 105 miles. The present examination of the line indicates that this is only possible with a very large increase of cost.

adjustment of the right of way than on the interior competing lines, and the close steamboat competition for way freight.

ROUTE No. 2, VIA LA GRANGE, CAMPBELLSBURG, AND EAGLE CREEK, LINES A, B, AND C.—These lines hold the same ground with Route No. 1 to the mouth of Sulphur Fork of the Little Kentucky. Thence ascending the Sulphur Fork and Sakersy's Branch, line A passes Campbellsburg to the right, and around the head-waters of Doherty Creek, to the ridge dividing the waters of the Little and Big Kentucky. Passing through this ridge, with a short tunnel of 500 feet, it descends the thickly timbered slopes of Mill Creek, with the maximum gradient, about 4 miles, to the abrupt bend at Batt's old mill, where it again cuts through with a short tunnel, to avoid a detour of 900 feet, with heavy curvature and grading; and, still descending the slopes of Mill Creek without further noticeable features, it reaches the Kentucky bottoms, and, deflecting up toward the mouth of Eagle Creek, crosses the river at the most suitable bridge site in the vicinity, about $\frac{1}{4}$ of a mile above Worthville. On line A an experimental was run from the dividing ridge by Long Branch, Lost Run, and Bishop's Run, very nearly upon the chord of the arc traced by the valley of Mill Creek; but the saving in distance was not found to justify the largely increased cost of work. A tunnel over 1,500 feet in length would be required at the head of Lost Branch.

Line B diverges from line A in the Sulphur Fork 2 miles from the Little Kentucky; thence, continuing up the Sulphur Fork with light work, it crosses the Mill Creek Ridge near Joseph Orem's, and holding that ridge for $4\frac{1}{2}$ miles descends to the middle fork of Gullion's Branch through a tunnel 2,800 feet in length. Thence $2\frac{1}{2}$ miles to the Kentucky valley it is found essential to use at least 80 feet per mile as the gradient, and this with very heavy work, including 2 embankments of over 90 feet fill, and a deep rock-cut or tunnel through the spur at the mouth of the branch. Two miles below this cut and running out the grade on the Kentucky slopes, it crosses the river at the bridge site of line A. The Gullion line was examined with great care as probably the shortest practicable

line between the termini. The distance saved over the shortest of all other lines is $1\frac{1}{2}$ miles, but the 80-foot grade, and the cost required to hold even that grade, present very grave objections to its consideration.

Line C diverges from line B near Dr. Humston's; thence (and crossing the ridge obliquely around the head-waters of Imlay's Run) it reaches the head of Cane Run in 2 miles from the point of divergence; thence for 2 miles from the summit cut the grading is not very serious, but in the last 3 miles the valley of the Cane Run becomes very crooked, and a tunnel about 300 feet in length is necessary in rounding its sharpest bend; thence to the bridge site at Lane's Landing the distance is $2\frac{1}{2}$ miles, and is accomplished with a gradient of 60 feet per mile from near the summit, which is the maximum used upon all the La Grange lines, the Gullion's Branch excepted. Notwithstanding the difficulties of the last three miles, it will be seen by reference to the tables of distance, grade, and cost that the Cane Run lines are among the most important of the survey. Alternative grade lines have been located upon both slopes of Cane Run.

The bridge site near Lane's Landing, and just above the mouth of Cane Run, is one of the most favorable on the river. Both banks are above the high water marks of 1832, near the abutment heads. The foundation of at least one pier is likely to be rock, and with very little drift or deposit to be removed. Good quarries of the hard blue lime-stone have been worked not far above, with water transportation to the bridge site. The facilities for work in supplies and steamboat access are unusual.

Of the La Grange lines, it will be observed that lines A and B cross at Worthville, and line C at the mouth of Cane Run. The first two, skirting the fertile Eagle bottoms, continue on with easy work and a good direction to an intersection with line C, $5\frac{7}{10}$ miles from Lane's Landing. The line continues thence on the north side of Eagle Creek for 14 miles up to the Elliston Gap, and thence into Ten-mile Creek, one of its larger branches from the north-east.

The Eagle Valley is very direct; its bottoms average in

D

breadth $1\frac{1}{2}$ miles, and the course of the creek through them is somewhat winding. The railroad line, cutting lightly through some of the spurs, holds a generally good course, and with favorable work. Good roads communicate with Owen and the interior counties. There are fine lands in the valley and upon its slopes, but the ridge country, as is generally the case in this section of the State, is more thickly settled and better improved than the bottoms. The towns and places of local note in and near Eagle Valley are New Liberty, Dallasburg, Sparta, and Napoleon.

Of all valleys on the Upper Eagle that of Ten-mile Creek is much the most favorable, in direction and gradients, in ascending and crossing the dividing ridge. The creek is bold, crooked, and with steep slopes; and heavy work is necessarily encountered to avail of its more important advantages. Several alternative lines have been run upon its slopes, and all possible cut-off lines carefully examined. At the Elliston Gap it has been found advisable to accept a tunnel of about 900 feet, to save a detour of nearly 2 miles, by the mouth of Ten-mile, with heavy graduation, bridging, and possibly one small tunnel on the longer line. Also, in passing up Ten-mile Creek, it is essential to cut through several spurs around which the creek turns abruptly, but there are also several miles of light bottom and slope grading. The slopes of Ten-mile, as well as Eagle, are thickly wooded with fine oak and locust, for cross-ties, contributing much to offset other drawbacks in the work.

At the head of the north fork of Ten-mile the line passes Verona; thence, for $6\frac{1}{2}$ miles of average ridge work, and crossing the head-waters of Mud Lick, with a very slight depression in grade, it strikes the head of Bank Lick Creek, 1 mile northeast of Walton, a thriving town on the Lexington and Covington Turnpike, which here crosses the railroad line, as a most important feeder for way business. As will be seen from the map, a cut-off line has been examined from the head of Myer's Spring Branch to Bank Lick, and with results sufficiently satisfactory to justify a surveyed line at a convenient time.

Passing the ridge with a small summit-cut, the line descends Bank Lick with easy gradients, and for 7 miles with very light work; crossing the Independence Turnpike (macadamized) 3 miles down. For 2 miles further the gradation becomes a little heavier. Ten miles from Covington the stream suddenly changes its character, being for the next 3 miles very tortuous, with steep slopes, sharp bends, and rapid fall. At the Fleming Bend, 9 miles from Covington, another tunnel cut-off is found practicable, which reduces the distance $1\frac{7}{8}$ miles, the tunnel at the neck of the Horse-shoe being but 400 feet in length. This work is upon the maximum grade, which continues 2 miles further, with 2 heavy fills and side cutting. Thence into Covington the location presents nothing difficult. The line passes through a very fine valley country, and is carefully placed to avoid undue damage to private property. Below the tunnel another excellent macadamized turnpike crosses the line, with a large and very valuable country travel; and thence the railroad and turnpike run parallel, but generally on opposite sides of the creek, passing the Latonia Springs 3 miles out from Covington.

In approaching Covington 2 lines were run, the first crossing the Kentucky Central Railroad at grade, and the second gradually ascending the west slope of Bank Lick Creek, near Latonia Springs, to a sufficient elevation at the second mile-post on the turnpike to cross the railroad directly over the tunnel near the Covington corporation line. While the first line, with lighter gradients, can be built for considerably less cost, the second line avoids even the possibility of a collision of trains, and the expense of watchmen night and day. That the damages resulting from one accident are likely to more than cover the additional first cost, by which collisions would be avoided altogether, is a very important consideration.

Passing into the city, the South Covington line terminates near the corner of Greenup and Thirteenth Streets, 1 mile from Cincinnati Suspension Bridge, and at a convenient point for connecting with any one of the many depot sites which hereafter may be found desirable in Covington.

For the Newport terminus 2 lines have been run, with suitable bridge-crossings at the Licking River, and both converging to a point readily accessible for any bridge or ferry connection with the Little Miami Railroad, on the north bank of the Ohio. The 3 terminal points of the several routes—West Covington, South Covington, and Newport—are nearly equidistant from the heart of Cincinnati, as fixed by the Ohio Suspension Bridge. Thus the very remarkable competition of routes is preserved to the terminal points; every reasonable depot facility, with suitable sites and approaches and connections with the competing railroads in Cincinnati, can be readily secured in either Covington or Newport.

For the West Covington terminus, as noted on Route No. 1, on the west corporation line, nearly opposite the depots of the Atlantic and Great Western, Hamilton and Dayton, Indianapolis, and Ohio and Mississippi Railroads, a connecting line has been run between the Bank Lick and River lines. It diverges from the first line 1 mile north-east of Walton, and holds the crest of the ridge with the Lexington turnpike as far as Florence, and with light grading. It then descends the upper slopes of Dry Run with the maximum grade to Pleasant Run Gap, and thence by the slopes of that run to the Ohio. Upon this section of the line the work is heavy, but it does not compare unfavorably with corresponding work on the Bank Lick line. The country along the entire line is highly improved.

From Louisville to the west corporation line of Covington the shortest distance, by the Cane Run line (60-feet gradients) via Eagle Creek and Florence, is $104\frac{7.9}{100}$ miles.

ROUTE No. 3, VIA SMITHFIELD, EAGLE CREEK, AND FLORENCE AND PLEASANT RUN.—All lines of this route straighten the Louisville and Lexington Railroad track from a point nine miles from Louisville, and via Floyd's Fork of Salt River to the Smithfield Station.

Two of these lines, A and C, hold the leading points of the experimental lines run in 1853 for the Little Miami Railroad, by Mr. T. Daniel, C. E. The papers of those lines, which are

placed at the disposal of this company, have greatly facilitated the present survey.

Line A leaves the Lexington track nearly opposite the house of Benson Ormsby, and running along the upper slopes of Goose Creek, about 2,100 feet north of Hobbs's Station, crosses the track a second time 1,100 feet north of O'Bannon's Station, saving in $2\frac{1}{2}$ miles over 3,000 feet in distance, and with light grading.

Thence, descending to Floyd's Fork near Floydsburg, it passes directly up to Smithfield and Eminence. The distance from Louisville by Floyd's Fork to Smithfield, by the straightened line, is $29\frac{3}{10}$ miles—the grading alternately in ridge and bottom work, with five bridge crossings on Floyd's Fork. It is possible to shorten this line still further, east of Floydsburg, by a ridge location, but probably at increased cost.

At Smithfield the line finally leaves the Lexington track, and crossing the head of the Little Kentucky, passes over the high rolling country of Henry County to the head-waters of Mill Creek, and thence down that creek to an intersection with line A, Route No. 2, on Ramsdale's farm. From that point to the eastern termini the description heretofore given will apply.

The distance upon this line from Louisville to the Ohio landing in Newport, opposite the Little Miami depot, as reported in the survey of '53 ($108\frac{7}{10}$), it has been found practicable to reduce to $107\frac{6}{10}$ miles, and with lighter profiles.

Line B diverges from line A on the Newcastle Ridge, $3\frac{3}{4}$ miles from Smithfield, and strikes directly for the head-waters of Imlay's Run, passing Newcastle (the largest town upon the route) $1\frac{1}{2}$ miles to the north. Taking the higher slopes of Imlay's Run, it again ascends and crosses the ridge with undulating grades to the head of the middle fork of Gullion's Branch, less than 1 mile from the town of Port Royal, and thence down Gullion's Branch by the line noted in detail on Route No. 2—crossing the Kentucky River below the mouth of Eagle Creek, and thence by Eagle Creek to Covington and Newport.

The same grave objections apply to this line as to the La

Grange Gullion, a gradient of 80 feet per mile for 5 miles, and at great cost. The shortest distance from Louisville to Covington is attained by this route; viz.: $102\frac{44}{100}$ miles.

Line C diverges from line B on the Palmyra Ridge, about $9\frac{1}{2}$ miles from Smithfield. Its course is thence direct to the head of Cane Run, and thence down the slopes of that run, with a gradient of 60 feet per mile, to the bridge crossing of the Kentucky River, near Lane's Landing, described in line C of Route No. 1. The description of the same line will again apply to Covington and Newport, the two lines being coincident. Line C is the shortest of all the lines run with 60-foot gradients—the through distance to Covington being $104\frac{3}{100}$ miles, and to the Newport terminus, $105\frac{33}{100}$ miles. The distance reported for the same route in 1853, to the same terminus, was $108\frac{6}{100}$ miles.

In addition to the lines on the Smithfield route thus reported, the country around Newcastle was closely examined, from the local importance of that town. An experimental line was run from Smithfield, passing by Newcastle to the head of Flag Run, and with favorable results that far. The descent of Flag Run, however, was found to present difficulties in grade and cost, which more than counterbalanced the advantages of the line in other respects.

A second line, from Radford's Station on the Lexington Railroad, passing close to Newcastle on the south, and thence down the West or Town Fork of Drennon Creek, was also carefully considered upon the notes of the line of 1853. The gradients to the Kentucky River were lighter than by the Cane Run line, but east of the Kentucky River, essentially the same maximum grade ($59\frac{33}{100}$ feet per mile) was found necessary. The largely increased distance over other lines, $112\frac{89}{100}$ miles (then reported), rendered further surveys unnecessary.

ROUTE No. 4, VIA EMINENCE, DRENNON CREEK, AND EAGLE CREEK.—Line A diverges from the Floyd's Fork line $22\frac{3}{4}$ miles from Louisville, and takes a direct course up the slopes of that creek and one of its branches to the ridge dividing the Kentucky and Salt River waters, and strikes the Lexington track

30 $\frac{1}{4}$ miles from Louisville. One mile and a quarter beyond it again touches the track about half a mile from the Eminence depot, and bears off toward Drennon Creek. The grading thus far is favorable, and continues with light ridge work 3 miles from Eminence to the head of McIlvaine's Run, a branch of Drennon Creek, where the line descends with a grade of 60 feet per mile to the bottoms of that creek. The McIlvaine work is heavy, and a high bridge will be required over the west fork of Drennon; but from the end of the 60* feet grade to the mouth of Imlay's Run there is light bottom work. From this point to its mouth, Drennon Creek bears considerably out of the desired direction, while Cane Run, bending to the southward, narrows the intervening ridge so much as to suggest a tunnel cut-off line, to avoid the waste of distance in turning into the Kentucky valley by the mouth of Drennon. It was found practicable thus to save 5 miles by a tunnel 2,700 feet in length. The line ascends the slopes of Drennon, commencing the maximum grade at the mouth of Imlay's Run, and holding this grade 2 $\frac{3}{4}$ miles, strikes through the ridge at a favorable pass opposite the old Drennon Springs. Thence by the slopes of Elm Spring Branch, it descends to the slopes of Cane Run; and thence, with continued heavy work, 2 miles down to the bridge site on the Kentucky River, above the mouth of Cane Run. East of the Kentucky River the Eagle route is taken to Covington.

The distance by this line from Louisville to Covington is 104 $\frac{3}{10}$ miles, and to the Newport terminus, 105 $\frac{6}{10}$ miles. The corresponding Drennon line of the surveys of 1853 gave a distance of 112 $\frac{7}{10}$ miles to the same terminus, with lighter gradients west of the Kentucky; the same maximum gradient east; but with profiles indicating greater cost.

Line B of the Eminence route diverges from A at the mouth of Imlay's Run, and runs down Drennon Creek, with light work to its mouth, where there is an excellent bridge site. An experimental line was also run from the mouth of Dickens's Branch, 1 $\frac{1}{2}$ miles above the mouth of Drennon, tunneling

*Sixty-six feet gradients were first used on the Eminence lines; but sixty feet were afterward found attainable at an increase of cost not very large.

through to another branch leading to the Kentucky bottom, near Springport, with a bridge crossing near Marion, and connecting with an experimental line, run by Mr. T. S. Garnett, C. E., in 1852, up Twin Creek, and by Poplar Grove, down Long Branch to Brush Creek, and then by Eagle into Ten-mile. The direction is favorable, but the steep gradients required east of the Kentucky River rendered unnecessary any calculations for cost.

ROUTE NO. 5, VIA PLEASUREVILLE, OWENTON, TEN-MILE CREEK, ETC.—The report of this line is made upon a reconnaissance, in connection with a rapid compass line for general direction and distance, by Capt. S. W. Hunt, County Surveyor, and Mr. W. T. Bartly, of the Company's Engineer Corps, with levels to test the practicability of a 66-feet gradient for the controlling points of the route.

The Pleasureville line would leave the Eminence line from a suitable point near the head of Bullskin Creek, and cross the track of the Lexington Railroad not far from the present Pleasureville depot, about $34\frac{6.8}{100}$ miles from Louisville. Thence the line passes, with 1 mile of light ridge work, to the headwaters of Six-mile Creek, and it descends this valley with favorable direction and gradients to the Kentucky River at Lockport. The grading and bridging upon the Six-mile division of this route is materially lighter than the corresponding work upon the other routes from the ridge down to the river; the heavier gradients will not be required for more than 3 miles.

The Kentucky River is crossed at an excellent bridge site above Lockport; the approaches good, and a superior quarry in the vicinity, from which was taken the stone for the State dam below. The water way required will be slightly less than at Lane's Landing.

At a very short distance from the eastern bridge head, and through one of the finest sections of the Kentucky valley, the line would strike the second bottom, facilitating an immediate ascent by the river slopes to the ridge country above. From high water mark on the Kentucky River to the general level of

the Owen Ridge, an elevation of 409* feet must be overcome. The most convenient valleys in this direction are Clay Lick and Severn Creek: the first, short, direct, and with rapid fall; but, even with the heavier work required in consequence, much more desirable in other respects than the more circuitous line of Severn Creek. It is essential therefore to commence the ascent with the 66-foot grades on the second bottom, and to cross the Hog-trough Run at the Gratz Landing with an embankment of at least 60-foot fill. Just beyond Gratz the line curves from the Kentucky slopes upon those of Clay Lick Creek; and for $4\frac{51}{100}$ miles, up to the ridge near Mt. Pleasant Church, it will encounter work of the same character with the heavier grading on the Cane Run lines. The summit cut would be heavy, but would not be regarded as especially formidable if the line were perfectly acceptable in other respects.

From this cut to a turn in the ridge, 3 miles from Owenton, the grading is light. Thence for 2 miles the ridge crest, deeply indented by hollows from Mill Creek, Severn, and Twin Creeks, becomes very winding, and requires either heavy curvature or a succession of thorough cuts and considerable fills. From near Owenton northward, the character of the country is much more favorable for railroad location, and an easy ridge line can be held for $3\frac{1}{2}$ miles, to the head-waters of Brush Creek, following closely the Owenton and Warsaw turnpike. The summit cutting will here be much less than at Mt. Pleasant, and the line descends by Smith's Run with the maximum grades to the slopes of Brush Creek, and thence with generally light work to an intersection with the Garnett line of '52, at the mouth of Long Branch; and from this point to the junction in Ten-mile Creek, with the present surveys, the profiles of that line are used in estimating. In Brush Creek one short tunnel will be necessary in turning Beattie's Bend, and 2 miles below a deep rock-cut through a second bend. As this creek is subject to heavy and very sudden rises, large spans and heavy masonry will be required for its 3 bridges.

At the mouth of Brush Creek it becomes necessary to run

*As given by a line of levels run by Col. J. Mason Brown.

down Eagle Creek, a little out of direction, to secure a suitable turn into the valley of Ten-mile Creek. Two miles up that creek, with two bridges and rather heavy cutting, the junction is made.

From Pleasureville to Ten-mile Creek, the materials for work—building stone, lime, and cement-rock, and timber—are abundant, with convenient access. The slopes of Six-mile, Clay Lick, and Brush Creeks are unusually well timbered with the best cross-tie oak, and quarries are at hand when required. The country upon either side is productive, and in Owen County quite highly improved. It also possesses mineral interest, from the lead mine explorations now in progress. A concise statement of the probable way business, based on present products, prepared by leading parties interested in the route, is communicated with the papers of this report, together with a similar paper from the La Grange and Eagle routes.

The distance, reported by Messrs. Hunt and Bartley, from Pleasureville to the junction at Long Branch, with the surveyed line of '52, is $36\frac{6}{10}$ miles, and the entire distance from Louisville to Covington is $111\frac{46}{100}$, and to the Newport terminus, $112\frac{69}{100}$. This distance, Capt. Hunt thinks, can be much reduced by a close location of the ridge lines. The estimated cost upon this line, as stated hereafter, is based upon comparisons with other lines of the survey which have been carefully run out; and is to that extent approximate.

The essential characteristics of the several lines thus described in detail are given in the annexed tabulated statement of distance, curvature, and grade.

NOTE.—Since the annexed tables were printed, the Smithfield cut-off survey has been closed, resulting in a reduction of distance of 2,690 feet, with an increased cost of \$27,500, and an increased ascent and descent of 78 feet.

No. 1.
TABULATED STATEMENT OF DISTANCE, CURVATURE, AND GRADES FROM LOUISVILLE (Beargrass Depot)
TO WEST CORPORATION LINE, COVINGTON (one Mile from Ohio Suspension Bridge).

ROUTE.	LINE.	LOCALITY.	Length of Line in Miles.....	ALIGNMENT.				GRADES.				
				Straight Line in Miles.....	Curved Line in Miles.....	Curvature in Degrees	Maximum Curvature ...	Miles of Level Road.....	Miles of In-clined Road	Maximum Grade in F't	Total Ascent East	Total Descent East.....
No. 1.	A.....	Via La Grange, Barbour's, Carrollton and Florence.....	110.23			*7,325	6°	32.56	77.67	60	1,282	1,140
No. 1.	B.....	Via La Grange, Sligo, Carrollton and Florence	108.63			7,205	6°	30.17	78.46	60	1,292	1,150
No. 2.	A.....	Via La Grange, Mill Creek, Eagle Creek and Florence.....	106.16	65.08	41.08	7,543	6°	18.92	87.24	60	1,625	1,483
No. 2.	B.....	Via La Grange, Gullion's Branch, Eagle Creek and Florence.....	104.29	63.86	40.43	7,152	6°	13.59	90.70	80	1,870	1,728
No. 2.	C.....	Via La Grange, Cane Run, Eagle Creek and Florence.....	105.94	66.73	39.21	7,847	6°	11.72	94.22	60	1,666	1,524
No. 3.	A.....	Via Smithfield, Mill Creek, Eagle Creek and Florence.....	107.07	69.84	33.36	6,208	6°	13.99	91.16	80	1,714	1,572
No. 3.	B.....	Via Smithfield, Gullion's Branch, Eagle Creek and Florence.....	103.20	70.68	36.39	6,690	6°	15.91	89.21	60	1,732	1,590
No. 3.	C.....	Via Smithfield, Palmyra Church, Cane Run, Eagle Creek and Florence.....	104.79	70.23	34.56	6,032	6°	10.25	94.54	60	1,698	1,556
No. 4.	A.....	Via Eminence, Drennon, Cane Run, Eagle Creek and Florence.....	105.06	64.24	40.82	6,777	6°	9.19	95.87	60	1,723	1,581
No. 5.	A.....	Via Pleasureville, Brush Creek, Ten-mile Creek and Florence.....	111.92				6°					

*From the report of Mr. T. Daniel, and approximately verified by examination of ground.

No. 2.

*TABULATED STATEMENT OF DISTANCE, CURVATURE, AND GRADES FROM LOUISVILLE (Beargrass Depot)
TO THIRTEENTH STREET, COVINGTON, (one Mile from Ohio Suspension Bridge.)*

ROUTE.	LINE.	LOCALITY.	Length of Line in Miles.....	ALIGNMENT.				GRADE.			
				Straight Line in Miles.....	Curved Line in Miles.....	Curvature in Degrees.....	Maximum Curvature....	Miles of Level Road.....	Miles of Inclined Road	Maximum Grade in F't	Total Ascent East.....
No. 2..	A.....	Via La Grange, Mill Creek, Eagle Creek and Bank Lick.....	105.40	63.69	41.71	8,110	6°	17.20	88.20	60	1,608
No. 2..	B.....	Via La Grange, Gullion's Branch, Eagle Creek and Bank Lick.....	103.53	61.65	41.88	7,718	6°	13.57	89.96	80	1,673
No. 2..	C.....	Via La Grange, Cane Run, Eagle Creek and Bank Lick.....	105.18	64.42	40.76	8,414	6°	11.09	44.09	60	1,819
No. 3..	A.....	Via Smithfield, Mill Creek, Eagle Creek and Bank Lick.....	106.31	69.25	37.06	7,257	6°	14.85	91.46	60	1,715
No. 3..	B.....	Via Smithfield, Gullion's Branch, Eagle Creek and Bank Lick.....	102.44	68.41	34.03	6,774	6°	12.93	89.51	80	1,687
No. 3..	C.....	Via Smithfield, Palmyra Church, Cane Run, Eagle Creek and Bank Lick.....	104.03	68.80	35.23	6,600	6°	9.17	94.86	60	1,681
No. 4..	A.....	Via Eminence, Drennon Creek, Cane Run, Eagle Creek and Bank Lick.....	104.30	62.81	41.49	7,340	6°	7.21	97.09	60	1,768
No. 5..	A.....	Via Pleasureville, Brush Creek, Ten-mile Creek and Bank Lick.....	111.39				6°			66	

No. 3.												
TABULATED STATEMENT OF DISTANCE, CURVATURE, AND GRADES FROM LOUISVILLE (Beargrass Depot) TO LANDING OPPOSITE LITTLE MIAMI DEPOT, NEWPORT (one Mile from Ohio Suspension Bridge.)												
ROUTE.	LINE.	LOCALITY.	Length of Line in Miles.....	ALIGNMENT.				GRADE.				
				Straight Line in Miles.....	Curved Line in Miles.....	Curvature in Degrees.....	Maximum Curvature...	Miles of Level Road.....	Miles of In- clined Road	Maximum Grade in F't	Total Ascent East.....	Total Descent East.....
No. 2.	A.....	Via La Grange, Mill Creek, Eagle Creek and Bank Lick.....	106.70	64.40	42.30	8,262	6°	18.19	88.51	60	1,608	1,493
No. 2.	B.....	Via La Grange, Gullion's Branch, Eagle Creek and Bank Lick.....	104.83	61.98	42.85	7,870	6°	14.87	90.96	80	1,673	1,558
No. 2.	C.....	Via La Grange, Cane Run, Eagle Creek and Bank Lick.....	106.48	65.14	41.34	8,566	6°	12.39	94.09	60	1,704	1,589
No. 3.	A.....	Via Smithfield, Mill Creek, Eagle Creek and Bank Lick.....	107.61	69.59	38.02	7,409	6°	15.77	91.84	60	1,715	1,600
No. 3.	B.....	Via Smithfield, Gullion's Branch, Eagle Creek and Bank Lick.....	103.74	69.13	34.61	6,827	6°	14.23	89.51	60	1,697	1,582
No. 3.	C.....	Via Smithfield, Palmyra Church, Cane Run, Eagle Creek and Bank Lick.....	105.33	69.14	36.19	6,752	6°	10.09	95.24	60	1,681	1,569
No. 4.	A.....	Via Eminence, Drennon, Cane Run, Eagle Creek and Bank Lick.....	105.60	63.15	41.45	7,492	6°	8.13	97.47	60	1,676	1,561
No. 5.	A.....	Via Pleasureville, Brush Creek, Ten-mile Creek and Bank Lick.....	112.56				6°			66		

The estimated cost of the several lines will appear in the subjoined tables: the First Division comprising all work from Louisville to the point of divergence from the Louisville and Lexington Railroad; the Second Division thence to the Kentucky River; and the Third Division from the Kentucky River to the eastern terminus.

In the calculations care has been taken to embrace every reasonable contingency of work. In all cases of doubt, the quantities are intentionally computed in excess of probable requirements, and with a reasonable assurance that they can be materially reduced upon a careful relocation for construction. The prices for graduation, masonry, and bridge superstructure exceed the prices at which work has recently been let to responsible contractors in this vicinity.

The annexed tabular statements, under appropriate headings, give both the general summary of cost for the road fully completed, and the first cost required to open the road and place it in secure running order. It is obvious that no ballast should be used on embankments until they have become well settled by one season's travel. On every line surveyed there are four or five embankments, which can be more cheaply built by using the railroad track and its engines for the haul; and upon which strong trestle bridges would in consequence be advisable, which could be used seven years if desired. It is also the subject of future consideration, at what time the work essential for the straightening of the western end of the road (First Division) can be done most advantageously. All these items are included in the "general summary of cost," but are deducted in the columns of first cost required to open the road.

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It is evident, from an examination of the above tabulated statements, that the final selection of the preferred line will depend upon three controlling considerations not strictly engineering in their character.

1. The most advantageous railroad connection north of the Ohio River, both for future business and for co-operation in building the road—whether opposite Newport, with the Little Miami Railroad and its Pennsylvania and Eastern connections, or opposite West Covington, with the Atlantic and Great Western Railroad and its New York connections.

2. The interests of the Louisville and Lexington Railroad, in fixing that point of divergence which will reduce to a minimum its own working expenses, both east of the junction and on the more direct or straightened line to Louisville. And illustrating this point: From Pleasureville, the most eastern junction considered, the straightened road would save eight and a half miles in the running of every engine and train from Lexington to Louisville, which, with the increased value of Cincinnati business to stations beyond, the Superintendent estimates now to be equal to the interest (six per cent.) on \$540,000. This element enters with almost equal force into the discussion of the Smithfield and Eminence routes, and would be credited (with other considerations) against the greater first cost of those lines.

3. In connection with the above, the most desirable way business and other local considerations.

Until the first, and possibly most important, of these considerations can be determined, it is manifestly against the interest of the Company to indicate prematurely, through its engineer, the special consideration of any one route or line. Data fully sufficient are communicated in this report to determine the more important questions for present action; viz.: the limits of distance and cost, grade and curvature, within which the Cincinnati Branch can certainly be built, to either one of the desired termini. And within these limits the difference is not such as to preclude the adoption of at least one good line to each terminus.

A final comparison of the relative engineering and commercial advantages of the several lines is, therefore, reserved from print until, in your judgment, the interests of the enterprise permit.

TIME OF COMPLETION AND PLAN OF WORK.

Upon every route surveyed there are a few sections which will require for construction nearly double the time of the average work of the line, and therefore limit the date of completion of the entire road.

With steady progress, under good contractors, and the usual amount of force, the heaviest work upon the lines herein reported can be finished within two years from the time of breaking ground. Should urgent need arise for the earlier use of a through track, the topography of the country will permit of an easy application of the usual expedients for a temporary passage of the ridges by heavy gradients; and a ferry can be used at the Kentucky River.

If the time be fixed at two years, an expenditure of \$500,000 during the first nine months would advance the heavier graduation and masonry sufficiently to secure its completion at the same time with the lighter work, if then commenced and vigorously pressed. The track can be rapidly laid, by four parties if deemed essential, the Kentucky River affording facilities for delivering iron at intermediate points.

As to the letting of this work, there are at present certain indications of a spirited competition by the best contractors. Labor is abundant at falling rates, and the country is full of supplies. The time is favorable for contract work.

ESTIMATE OF TRAFFIC.

The estimates for the future earnings of the new road have been made (by request) by the Superintendent of the Louisville and Lexington Railroad, as coming with special fitness and force from an officer long familiar with the country, and under whose working management for twelve years the Lexington Railroad has uniformly prospered. These estimates (as set forth in the accompanying statement) are undoubtedly correct; and I do not hesitate to record the opinion, based on personal observation in similar cases, that within two years after the opening of the road Mr. Gill's estimates will be exceeded by the actual receipts.

It may be proper, in connection with this estimate, to invite attention to a few general considerations. The transportation of passengers and freight is fast becoming the leading interest of the land; and the greatest local prosperity is found distributed upon the great routes of railroad travel. Three of these, converging to New York and Philadelphia from the far West, from New Orleans and the South-west, and from the sea-board South, will probably control the mass and tide of travel for many years to come; and the Louisville and Cincinnati Railroad is the short unclosed link of at least the second of these great routes. Without dwelling upon the many secondary routes from Memphis and the South-west, from Nashville and the South, which converge to the pro-

jected railroad as a single stem, it must be apparent, apart from estimates and calculations, that its through business must be very large.

It is also more than probable that the local trade between Louisville and Cincinnati is already in itself sufficient to justify a direct railroad connection. The reciprocal business relations of neighboring cities is even at this day imperfectly understood. A singular dual law of mutual benefit, seemingly paradoxical, governs them. The larger city does not absorb and deplete, and it very rarely injures, the smaller city. Such cities, two and two, certainly do thrive upon an emulous competition for outside business, as well as upon a better understanding of their own mutual wants and improved facilities for meeting them. New York and Boston, Philadelphia and New York, Baltimore and Philadelphia, Pittsburgh and Cincinnati, Cincinnati and St. Louis, and many other cities attest this fact by the increasing number of new routes by rail and water constantly undertaken to meet their increasing business. Is it not the part of wisdom to accept this fact, and to endeavor for local benefits to secure the control of that connection which, holding the shortest practicable route, promises the largest results?

The way business of the Louisville and Cincinnati Railroad will probably exceed that of any railroad in Kentucky. The lines surveyed embrace a beautiful and productive country, requiring only railroad access to place it upon a par with the most favored sections of the State. Its broken surface and attractive valleys constantly suggest picturesque sites for villas and country residences, with suitable localities for vineyards, fruit plantations, and market farms, upon any part of the line within two hours' access of either city. It is impossible to ride over this country without being impressed with the early prospect of the same character of valuable improvements which line the railroads between the larger cities eastward. At the Covington end of the surveys villa improvements are already met fifteen miles out, and they are extending. Wherever information could be obtained, the turnpike receipts were found to be very large, and to indicate a steadily increasing business, particularly in the market trade, and already of sufficient importance to require special provision in the running arrangements of the completed road.

These remarks are thrown out suggestively, and in connection with the generally received impression that "the projected Louisville and Cincinnati Railroad is the most valuable unoccupied route in the United States."

In submitting the papers of this report, the results of their labors,

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I take pleasure in bringing to special notice the valuable services of the gentlemen of the corps. Their rapid and thorough work enables me to close within the allotted time a survey unusually extended, and of which the more important grade lines have been carefully located. A list of the two field parties, under Messrs. Peyton Randolph and John MacLeod, is appended in Statement "A."

I also desire to acknowledge the courtesies and facilities for work constantly extended to the corps by the officers and agents of the Lexington Railroad.

Respectfully,

I. M. ST. JOHN,
Chief Engineer.

A.

LIST OF ENGINEER CORPS

ON THE LOUISVILLE AND CINCINNATI BRANCH RAILROAD SURVEY.

PARTY No. 1.

PEYTON RANDOLPH.....	PRINCIPAL ASSISTANT.
L. A. DADE.....	SURVEYOR.
THOMAS LAWSON.....	LEVELER.
F. WARREN.....	TRANSIT ASSISTANT.
T. K. BARBEE.....	LEVEL ASSISTANT.
J. H. LUCKETT.....	RODMAN AND CHAINMAN.
C. J. BOYLE.....	" "
L. L. DUNCAN.....	" "

Four colored—axmen, etc.

PARTY No. 2.

JOHN MacLEOD.....	PRINCIPAL ASSISTANT.
MARSHALL MORRIS.....	SURVEYOR.
C. B. BRECKINRIDGE.....	LEVELER.
T. H. McMICHAEL.....	TRANSIT ASSISTANT.
H. H. LUCKETT.....	LEVEL ASSISTANT.
C. A. WALTER.....	RODMAN AND CHAINMAN.
C. E. PHYTHIAN.....	" "
J. N. STOUGHTON.....	" "

Four colored—axmen, etc.

OFFICE ASSISTANTS.

EDWIN THACHER.....	DRAFTSMAN.
W. J. BARTLEY.....	CALCULATOR AND GENERAL ASSISTANT.

I. M. ST. JOHN, *Chief Engineer.*

CHAPTER 308.

An Act to amend the Charter of the Louisville and Frankfort and Lexington and Frankfort Railroad Companies, and to repeal all Acts, and Acts amendatory thereof, authorizing the construction of a Railroad from any point on the line of either of said Roads to the cities of Covington or Newport.

SECTION 1. Be it enacted by the General Assembly of the Commonwealth of Kentucky, that the Charter of the Louisville & Frankfort and Lexington & Frankfort Railroad Companies, in addition to the powers heretofore conferred upon them by their respective charters and the various amendments thereto, shall be and they are hereby so amended as to authorize said companies to build, equip, and operate a branch railroad and telegraph line from any point on the line of their roads above La Grange to the Ohio River, or to a point near thereto, at or near the cities of Covington or Newport, and also a telegraph line along their present roads; provided, that in the construction and operation of any road so built, said railroads shall have all the rights, powers, and privileges conferred by the Charter of the Louisville & Frankfort Railroad, and the various amendments thereto.

SEC. 2. It shall be lawful for said companies, and they are hereby vested with full power and authority, to issue and sell the joint bonds of the said companies, in such form and in such amounts, and payable at such time and places, bearing interest not to exceed seven per cent., payable half yearly, as they shall deem proper, and to an amount not exceeding three millions of dollars, and secure the same by a deed of trust on said railroads and branch road, and all their property and effects, conditioned for the prompt and punctual payment of the interest on said bonds as it shall fall due, and the principal when it shall become due; and with authority for the trustee or trustees to sell said railroads and all their property to raise the money to pay such

interest and principal, if not punctually paid, on such notice as may be stipulated and fixed in said deed of trust, without suit and decree of foreclosure. Provided, however, that should said roads be sold under said deed of trust, the purchaser shall be entitled to all the rights and privileges of the charters and the various amendments thereto, and subject to all the objections, limitations, and restrictions of the same.

SEC. 3. Be it further enacted, that the said railroad companies may sell the bonds hereby authorized on such terms of discount as they may deem to be to the interest of the said companies. Provided, also, that they may receive in payment therefor any property and materials or labor used or to be used in the construction of said road.

SEC. 4. Be it further enacted, that the Lexington & Frankfort Railroad Company may increase its capital stock three hundred thousand dollars, and that the Louisville & Frankfort Railroad Company may increase its capital stock seven hundred thousand dollars; and the said railroads may, at any time and place, without the formality of opening books for public subscriptions, or appointing commissioners for that purpose, receive subscriptions for stock in their respective companies by individuals, cities, counties, or other corporations, whether payable in money or other things, upon such terms and time and kind of payment as may be agreed upon and set forth in the subscription; and when the stock so subscribed is paid for, certificates therefor shall be issued to those entitled thereto. Said companies may also contract to pay in the capital stock of either of said companies for any thing necessary to carry on the work of construction, or to pay any debt of the companies, or may sell, convey, and deliver any property received for stock, or mortgage or pledge the same.

SEC. 5. Be it further enacted, that said companies may procure the right of way for the railroad authorized to be built hereinbefore, to an extent of not more than one hundred feet in width, in the manner prescribed in the Charter and the amendments thereto of the Louisville & Frankfort Railroad Company, and may build bridges over the Kentucky and Lick-

ing Rivers; provided said bridges are built so high as not to obstruct, materially and continuously, the navigation of said rivers.

SEC. 6. Be it further enacted, that the said companies may call on the cities of Louisville, Covington, and Newport, or any one or more of the counties through which the said branch road may be located, or on any county adjacent thereto, to purchase of the bonds herein authorized to be issued, to an amount not exceeding two hundred and fifty thousand dollars each, from the cities of Louisville, Covington, and Newport, and not exceeding one hundred and fifty thousand dollars from any one of the said counties; and upon such call or application it shall be the duty of the Mayor of the respective cities, and of the County Judge of such counties, respectively, so called on, to give public notice designating a day and causing polls to be opened at all the election precincts in their respective cities or counties, and cause a vote to be taken by the qualified voters for and against such call or application, of which notice shall be given within ten days after said application is made; and the time and places for such voting shall be published in the manner now required by law in the election of members for the State Legislature, for at least three weeks preceding the day of such voting; and if at such election or voting a majority of the votes cast shall be in favor of such purchase, then it shall be the duty of the Mayors and County Judges of the respective cities and counties to make such purchase for their respective city or county in the amount specified in the call; and at any such voting or election it shall be the duty of the officers, now required by law to appoint judges and clerks and other officers, to superintend and conduct said votings or elections in the counties, with such powers and under such regulations as are prescribed and given to them at state or county elections for members of the Legislature, and in the cities with powers and under such regulations as are prescribed and given at city elections, and to make their returns of such votings or elections as in other county, city, or state elections; the County Judges and the Mayors of cities shall examine and compare the polls of the

vote so taken in their respective counties and cities, and declare and certify the result thereof, which, if in favor of such purchase, shall be recorded in the county or city clerk's offices of the respective counties and cities.

SEC. 7. Be it further enacted, that if said votes shall be in favor of such purchase, the Mayor and Council of said cities, and the County Court of said counties, shall within the current year levy upon all the property of said cities and counties subject to state revenue tax, an ad valorem tax at least equal to one fourth of the amount of bonds so authorized to be purchased, and cause the same to be collected and paid over to the said railroad companies, and may, for the residue of the purchase price of said bonds authorize the railroad companies to sell so many of said bonds as will raise the remaining three fourths of the sum agreed to be paid therefor; provided, that said bonds shall be taken by the authorities of said cities and counties at their par value. The Mayor and Council of said cities, and the County Court of said counties, shall appoint collectors of said tax, and shall take bonds with good security for the faithful performance of their duties, and said collectors shall have all the authority and power, and be subject to all the liabilities granted and imposed by law upon Sheriffs in the collection of the state revenue tax. If the Mayor and Council of said cities or County Court of said counties shall elect to hold said bonds, they shall proceed to levy, collect, and pay over to said railroad companies, in the manner aforesaid, in one, two, and three years, the residue of the amount agreed to be paid for said bonds; provided, that the provisions of sections six and seven shall not apply to the counties of Gallatin, Boone, Grant, Owen, Trimble, and Carroll.

SEC. 8. Be it further enacted, that said railroad companies may at any time straighten any part of their road between the city of Louisville and the point where said branch road shall leave the Louisville & Frankfort Railroad, and use the materials on such abandoned portions of their present road in making such change, and may purchase grounds for, and erect station, machine-shops, and other buildings, in the city of Louisville,

and may procure the right of way and extend their road through the city of Louisville, the Mayor and Council consenting thereto, or around the city of Louisville, to make connection with the Louisville and Nashville Railroad, and may use for the purposes above specified the funds herein authorized to be raised.

SEC. 9. This Act shall not go into effect until it shall have been submitted to the stockholders of each of said companies at a meeting called for the purpose, at least fifteen days' notice having been first given to the stockholders of the Lexington & Frankfort Railroad Company in a newspaper published in the city of Lexington, and to the stockholders of the Louisville & Frankfort Railroad Company in a newspaper published in the city of Louisville. The judges to take such vote shall be appointed in the way now provided in the respective Charters of said companies for the appointment of judges to hold elections for directors for said companies, and said judges shall have power to adjourn from day to day and from time to time, but when an adjournment is for more than one day, previous notice of ten days shall be given in the newspapers aforesaid of such adjourned meeting; and if at such meeting and adjourned meeting a majority of the stock of each of said companies shall vote in favor of this amendment, then it shall be in full force and effect as a part of their respective charters.

SEC. 10. Be it further enacted, that the directors on the part of the state in the Lexington & Frankfort Railroad Company may cast the vote of the state stock at the meeting of the stockholders of the Lexington & Frankfort Railroad Company, and they are hereby directed to cast the state vote in favor of this amendment.

SEC. 11. That as between themselves, the Louisville & Frankfort and Lexington & Frankfort Railroad Companies shall be held and deemed to be the joint owners of the road hereby authorized to be built, in the proportions now fixed by the agreement under which the joint roads of said companies are now operating, and each of said companies shall be required to contribute its proper proportion to the expense of construction, and shall be entitled to receive the same proportion of the

profits of said road when completed; and the management and control of said road while under construction, and after its completion, shall be vested in the Executive Committee of said roads, as now constituted under the operating agreement of said companies.

SEC. 12. That should the branch road herein authorized to be built not be commenced within one year, and not be completed within a period of five years from the passage of this Act, then this Act and the authority to build said branch road shall be of no effect.

SEC. 13. That an Act incorporating the Louisville & Newport Branch Railroad Company, approved March 1, 1854, and all the Acts amendatory thereof, be and the same are hereby repealed.

AMENDED ARTICLES OF AGREEMENT

For joint operation of the Louisville and Frankfort and Lexington and Frankfort Railroad Companies, adopted at the Annual Meeting of the Stockholders, July 30, 1859.

With a view to the more efficient operation of their roads, the Louisville & Frankfort and Lexington & Frankfort Railroad Companies have agreed as follows, to-wit:

ARTICLE 1. The whole line of road, from Lexington to Louisville, shall be run as one road, under the control of an Executive Committee of six members, four of whom shall be appointed by the Directors of the Louisville & Frankfort, and two by the Lexington & Frankfort Railroad Companies.

ART. 2. The members of the Executive Committee shall be appointed by the Directors of their respective roads, in the month following the annual meetings of the stockholders of the two companies. They shall hold their offices for one year, and until their successors are appointed, unless sooner removed by the Board from whom they received their appointment. Any vacancy, temporary or permanent, in the Executive Committee, may be filled by the Directors of that company in whose representation such vacancy may occur.

ART. 3. The Executive Committee shall keep a fair record of their proceedings; they shall annually (and at the first meeting succeeding their appointment) recommend to the two Boards of Directors a gentleman as President of the two companies. If the Boards are unable to agree upon a joint President, the Executive Committee shall select their own chairman, who shall be vested with such power as may be necessary for the proper working of the road, and his compensation shall be fixed by the Executive Committee. If the two Boards shall agree upon a common President, he shall attend on and preside over the meetings of the Committee, but shall have no vote unless he

shall have been selected from the Executive Committee. The Committee shall determine his salary.

ART. 4. The Executive Committee shall meet for the transaction of business at least once in each month, at such time and place as they may appoint. Special meetings may be held on the written request of any two members. Each member shall have his expenses paid when absent on business of the companies.

ART. 5. The concurrence of a majority of the Executive Committee shall be necessary to any valid action, and in all propositions in relation to the number of through trains per day, or in relation to the hours of their arrival or departure at or from Lexington, and on all questions affecting permanently the Lexington & Frankfort Road, said majority shall contain at least one member representing said Lexington & Frankfort Company.

ART. 6. The Committee may appoint and remove at will a Superintendent and such other officers as the business of the road may require, and shall fix their compensation. They shall cause a set of books to be kept in Louisville, in which shall be entered all the business of the joint roads. From these books shall be made a condensed monthly statement, showing the gross receipts, the general expenses under their appropriate heads, and the cash balance due each company; a copy of which statement shall be transmitted to the Directors of each company, and the balance due each company shall at the same time be paid to such persons as its Directors may appoint.

ART. 7. The receipts and expenditures shall be apportioned between the two companies, in ratio of the length of their respective roads—that is to say, sixty-five parts to the Louisville & Frankfort, and twenty-nine parts to the Lexington & Frankfort Railroad Company.

ART. 8. From and after 1st of July, 1859, all expenditures made by the Executive Committee in operating the roads, and all tax, insurance, repairs, or renewals of roadway, bridges, and buildings of either company, used for the joint purposes of the two companies, and all improvements, temporary or permanent,

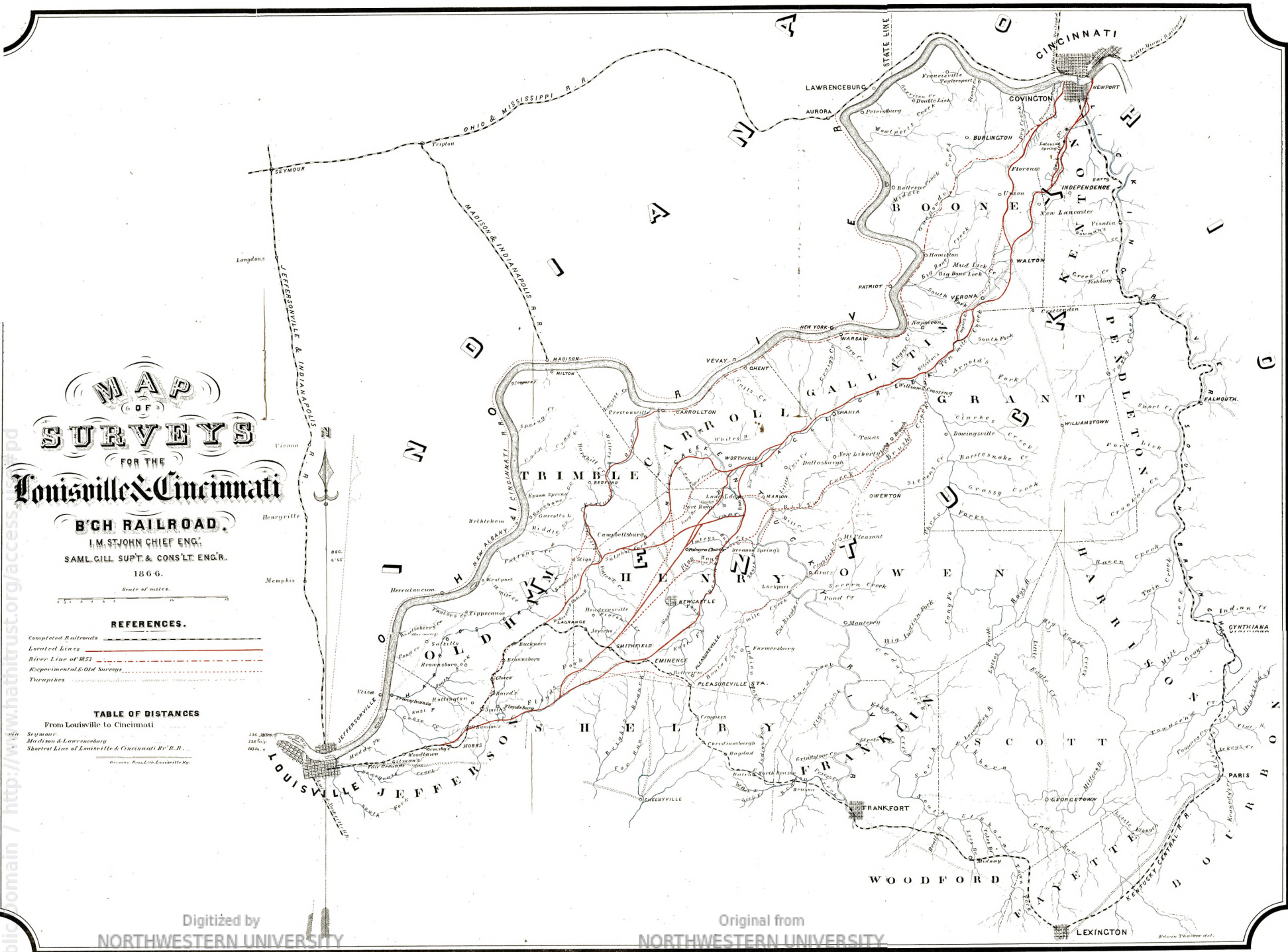
on the line of either road, shall be charged under the proper head to the joint account of the two companies. But in its expenditures for permanent improvements on the line of the road, the Committee shall endeavor from time to time to equalize the amount expended, so as that the whole road shall as nearly as possible be placed and kept in uniform condition. The Superintendent shall cause an account to be taken of the value of the material on hand (the property of either company) on the 1st day of July, 1859, for the repairs of roadway, bridges, and buildings used for the joint purposes of both companies. If either company shall, on such valuation, be found to have less than its proportion (agreeably to the ratio fixed in Article 7) of such materials, the company so deficient shall, from its own funds, supply the deficiency as the materials are required by the Executive Committee.

ART. 9. All taxes on the capital stock, and all the taxes and insurance on buildings or other property not used by the joint companies, and the salaries of such officers as may be employed by the separate Boards of Directors of the two companies, shall be paid by the company owning such property or employing such officers. And all moneys arising from rents or other sources outside of the operation of the road shall accrue to the sole benefit of the company owning the property from which the same is derived.

ART. 10. The Executive Committee is invested with all power necessary to carry out this agreement according to its true intent and meaning. Should any question arise as to the true construction and application of any clause, which can not be settled by themselves, they may refer its decision to three arbitrators in no wise connected with either company, one of whom shall be chosen by the Directors of each company, and the third by the two so chosen, and their decision shall be final.

ART. 11. This agreement shall take effect as of the 1st of July, 1859, and shall not be dissolved except by the mutual consent of the stockholders of both companies. In the event of a dissolution, the Committee shall ascertain the value at that

date of the permanent improvement made upon the road of each company, with the joint funds of the two companies. And if either company shall, on such valuation, be found to have received in such improvements more than its proportion (according to the ratio in Sec. 7) of the joint fund, then the company receiving such excess shall pay the value of the same to the other company.



MAP
(OF)
SURVEYS
FOR THE
Louisville & Cincinnati
B'CH RAILROAD.
I. M. ST. JOHN CHIEF ENG.
SAML. GILL SUPT. & CONS'T. ENG'R.
1866.

REFERENCES.

- Completed Railroads
- Locust Lines
- River Line of 1851
- Experimental & Old Surveys
- Thruways

TABLE OF DISTANCES

From Louisville to Cincinnati
Seymour
Madison & Lawrenceburg
Shortest Line of Louisville & Cincinnati B'CH R.R.
Average Road to Louisville Ky.



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