ANALYSIS OF RAILWAY FREIGHT TERMINAL OPERATION OF CHICAGO ILLINOIS

BY

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THESIS

FOR THE

DEGREE OF BACHELOR OF ARTS

IN BUSINESS ADMINISTRATION

COLLEGE OF LITERATURE AND ARTS

UNIVERSITY OF ILLINOIS

1912

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In addition to the above mentioned sources the writer received numerous personal letters relating to the terminal situation from the following:H.J.Merrick,General Superintendent of Trasportation,New York Central Lines,Mr. A.G.Huckin,General Freight Agent of the Illinois Northern,Mr L.T. Jamme,Vice-President of the Chicago Union Transfer Railway Co. Mr. A.B.Ramsdell,Superintendent of Terminals,Chicago,Rock-Island and Pacific.Mr Jas.Peabody,Statistican,Atchison,Topeka and Santa Fe.,Mr.J.L.Nichols,Superintendent of the Baltimore and Ohio Chicago Terminal Transfer Ry.

A great deal of the information was obtained directly by personal observations made while in the service of the Illinois Central Railroad,in the office of the Superintendent.

CHAPTER I.

INTRODUCTION.

Chicago,the second city of the United States in view of size,is the most strategicaly located metropolis,geographically speaking,in the Western Hemisphere,and may be termed the place of the"crossing of ways"between the Atlantic and Pacific,between the Northern Frontier and the Gulf of Mexico.The development of Chicago from an obscure frontier post,in I840,to one of the greatest commercial,industrial and financial centers of the world might,very properly,be called the eighth wonder of the world.To predict what the future will do for Chicago would be quite beyond the human immagination.

In order to better illustrate the point of the preceding paragraph a few statistics will be given from which a most amazing comparison may be reached.First,in regards to the increase of areas, which are as follows for their respective years:*

February	I835	2.55 square miles
March	I837	I0.635 ,, ,,
February	I863	24.282 ,, ,,
May	I887	36.662 ,, ,,
June	I889	I69.882 ,, ,,
November	I9I0	I9I.325 ,, ,,

Not only has Chicago increased herself as regards to area but in population.The increase has been far greater than the increase of additional territory.The population is by years as follows:

*Chicago Daily News Almanac,I9I2,PP 528.

I83I	population of 60	I890	population I,099,850
I840	4,470	I900	I,698,575
I850	28,296	I905	I,94I,880
I860	I09,460	I907	2,039,202
I870	238,296	I9I0	2,I85,283 *
I880	475,000		

Owing to the great advantages offered by Chicago in regard to the labor supply,both skilled and unskilled,to its great transportation advantages,as to the Great Lakes and railways,to its economic location,as well as to the many other advantages;the manufacturing output is constantly increasing by appreciable amounts yearly.The following table shows a very clear and comparative study of Chicago's industries and the increase in per cent for the intervening years:

Classification	I904	I909	% increase
Number of plants	8,I59	9,663	I8
Capital	$ 97I,990,000	$ 637,743,000	52
Cost of materials	589,9I4,000	793,57I,000	35
Salaries and wages	I82,006,000	240,056,000	32
Misc'l.expenses	96,298,000	I23,037,000	28
Value of products	955,036,000	I,28I,3I3,000	34
Value added by manufacturing	365,I22,000	487,742,000	34
Employees	40,276	54,83I	36
Average number of wage earners	24I,984	293,992	2I *

* "35th Annual Report of Public Works,City of Chicago" I9I0,pp I87.

It is thus seen,that an enormous increase of fifty-two percent has been made in the amount of capital invested,showing to what extent the resources of the industries are being aided. The increase of raw materials is of great importance in so far as it bears a very direct connection to the transportation field and the same is true of manufactured products.The cost of new buildings for the year I892 was $64,704,800,while in I9II,it was for ten months,$9I,290,400.* Of these amounts quite a large proportion was invested in factory buildings.

A brief summary of last year's business in the more important items,which are very closely allied to the railway terminal problem,is as follows:**

Manufacturing		$ I,487,I28,225
Wholesale Trade		I,905,989,000
Live Stock Sales		338,88I,000
Grain and Flour	bu.	29I,267,982
Railroad Gross Earnings	$	522,945,000
Railway Mileage		52,766
Lake Traffic	tons	I5,957,007

That the railways are being benefited by the prosperity of the Middle West is borne out by the fact that the mileage has increased from only a few miles in I852,to twenty three trunk lines,representing nearly a third of the total mileage of the United States.In I852,there was only one railroad entering Chicago,and that was the Galena and Chicago Union, which was finished for a few miles.

* "Chicago Daily News Almanac" I9I2, Pp 528.

In I854, there were ten trunk and three branch lines entering Chicago and which were in active operation.The rising importance of Chicago,as a railroad center,is evident by the fact that by I855,there were 2,933 miles,however,the number of trunk lines remained the same.In I857,the mileage reached 2,933 miles, and the increase of another trunk line and that being the Fort Wayne route of the present Pennsylvania System.

The gross earnings of the railroads tapping Chicago are increasing in proportion to the increase of commerce of that city. The gross earnings of the twenty three trunk lines increased $30,II6,055,justifing the foregoing statement.Gr oss earnings of twelve steam railroads,having operating headquarters in Chicago were,for the year I9II,$522,945,7I9,November in part and December estimated.Compared with $492,829,664 in I9I0,there is a gain of some II%.The comparisons made with the statistics of eleven years ago emphasize the fact that there has been sustained progress in Chicago's railroad enterprises.The gross earning have increased $260,448,I05 or,99.08%;freight moved 92,674,562 tons or, an increase of 84.8I%;gross earnings per mile $2,976.93 or,42.09 % and miles operated I4,893 or,39.37 %

Chicago has a most ideal location for a central market, both geographically and industrially.The center of population is at close proximity,this is the most important factor although the center of area is quite a bit removed,the developments in agriculture,in the middle west,offsets that disadvantage.

Nearness to raw materials,favorable climate,population, resources,power and labor are the most important factors in determining the central market place.Only one factor can make

any city a central market,even with all of the above mentioned prerequisites,and that is a good transportation system,properly located and operated.

Without good transportation facilities the industries of the country could not have located near Chicago,but they would have had to be distributed over the country.Without excellent switching arrangements the industries would not have had the privilege of locating in the most advantageous locality,in respect to their needs as is now possible,with the immense number of choice industrial sites adjoining the Belt Railway or the Chicago Junction Railroads.

It is thus evident that the present rapid growth of Chicago is dependent on the terminal railroad operations to a very considerable degree.As the present rate increases,both in area and in the industrial lines,the roads entering Chicago face a very important problem as to what the future will demand.Is it not a super-human task to be able to plan what properties a railroad should need within the next twenty years? Now it seems that about as soon as definite plan has been proposed and built the new facilities are insufficient to meet the increased needs.

All the various railroads that enter Chicago begin or end there.Dun's Review places the total mileage at 52,766 miles. The most important railroads of the United States have lines which enter the city;the New York Central with no less than five lines and the Pennsylvania with two large lines.

From the south the Illinois Central approaches the city with a direct line to the Gulf of Mexico and the Frisco is now preparing to enter the field as an active competitor of the Illinois

Central.From the south west we have the Frisco,the Chicago,Rock-Island and Pacific and the Santa Fe;from the west the Burlington, North-Western and Great Western and from the north west the Soo and the Chicago,Milwaukee and St.Paul system.

The Sante Fe and the Chicago,Milwaukee and St.Paul are of particular importance for the reason that they have a direct connection with the Pacific coast cities,thus uniting more closely the great south-west and north-west with the fertile central region and from the present indications they will be the greatest districts of North America.

The following is a list of the railroads that at the present time enter the city of Chicago,beginning at the east and continuing clockwise towards the north:

East-

Grand Trunk Western

Pere Marquette

Michigan Central

Lake Shore and Michigan Southern

Erie

Baltimore and Ohio

New York, Chicago and St. Louis

Pittsburgh,Ft.Wayne and Chicago

Southeast-

Chicago,Indianapolis and Louisville

Chesapeake and Ohio of Indiana

Chicago and Indiana Southern

Pittsburgh,Cincinnati,Chicago and St.Louis

Cleveland,Cincinnati,Chicago and St.Louis

South-

Illinois Central

Chicago and Eastern Illinois

Chicago and Alton

Southwest-

Chicago,Rock Island and Pacific

Atchinson,Topeka and Santa Fe

Wabash

West and northwest-

Chicago,Burlington and Quincy

Chicago and Northwestern

Chicago Great Western

Chicago,Milwaukee and St.Paul

Soo Line

CHAPTER II.

PRESENT CONDITIONS OF INTERCHANGE OF TRAFFIC.

At present there are twenty three trunk lines entering the city of Chicago,representing about thirty-three percent of the entire mileage of the United States,there being ten western and thirteen eastern lines.Of the total forwarded and received business the western roads handle about 66 % and the eastern lines about 24 %.Of the outbound business they handle 67 % and 33 % respectively.Nearly thirty percent of all the cars received and forwarded are "through traffic"cars,originating beyond and destined to points beyond Chicago.

No trunk line centering in Chicago is able to make direct interchange with all other roads.Possibly the nearest exception to this statement is the Chicago,Rock Island and Pacific,which can deliver to all roads with one exception and that is,the Chicago, Milwaukee and St.Paul.In general,the interchange business must be carried on through the medium of an intermediate carrier,as the Belt Railroad or the Baltimore and Ohio Chicago Terminal Transfer Railroad.For the service of transferinf a car from one road to another a flat rate is charged per car,both loaded and for the return of the empty,although the rate charged for the return of the empty is about one-half the rate charged for the movement of the loaded car.On the Belt Railroad the charge for the loaded car is $2.50 and $I.25 for the return of the empty.

Approximately ten thousand cars are daily delivered from one road to another.Some originate outside of Chicago and pass through the city destined to some point beyond;some originate at

industries in Chicago and go forward from Chicago to points outside,on roads other than the one on which the shipment originated; other cars are moved from one industry to another,located within the Chicago switching district,on two separate roads.

For the purpose of interchange traffic,the trunk lines as the Chicago,Milwaukee and St.Paul and the Illinois Central resort to intermediate carriers for the transfering of cars to connecting lines.We may divide the Chicago switching district into three zones,the boundaries of which are the three belt lines,forming a half-moon figure about the city.For the "inner zone",we may regard it as the district which is served by the Belt Railway of Chicago,running from South Chicago to Cragin;the "intermediate zone",may be regarded as the district lying between the Belt and the Baltimore and Ohio Chicago Terminal Transfer Railroad;and the third district as the district lyiny between the last named road and the Elgin,Joliet and Eastern.

As the city increases so will the traffic increase and it is very likely that the Elgin,Joliet and Eastern will become more prominent in the matter of car interchange.This road runs around the city on about a thirty mile radius and at present performs transfer service for the United States Steel Co. and connecting lines.In using the outer belt lines much time would be saved in transfer,owing to the increasing tendency of congestion on the inner belt lines.

The trunk lines also deliver interchange traffic to otheer lines by means of their own switch engines and crews.An example of this character of interchange is that between the "Nickle Plate" and the Illinois Central.In many cases,where interchange is direct

traffic agreements are in force between the different roads.An instance of this of this kind is found in the agreement between the Pittsburgh,Ft.Wayne and Chicago and the Illinois Central.This agreement is to the effect that for the period of one month,one of the two lines will do all the transfer business between the two lines,the following month,the other road will perform the service for both roads.In this case,the road doing the service will take all cars for the other road and will deliver them to the general yards of the other party.On the return trip the crew will bring back all cars destined to points on their road.This is a very good feature and is worthy of attention,for this method will greatly diminish the loss of time in making the round trip,for in most cases where interchange is done in a more indeoendent manner,one half of the trip will be light,leaving the other road to use an engine of its own in transfering cars to the former road.

In case of perishable freight,of live-stock and other high class commodities requiring very prompt movements,received after the day's transfers have been made,a special trip will have to be made regardless of whose turn it is to make the interchange. For example of this character,showing the workings of the interchange agreement,that of the"Fort Wayne" and the Illinois Central is referred to.

The Chicago,Rock Island and Pacific is very fortunate in having direct track connections with all roads with the exception of the Chicago,Milwaukee and St.Paul.All the eastern and southern lines are directly connected by means of a line of the Chicago,Rock Island and Pacific,running from Gresham Yard,which is about 3½ miles north of the Burr Oak yard,east to South Chicago.

This spur crosses the Illinois Central,New York Chicago and St. Louis,Lake Shore and Michigan Southern,Baltimore and Ohio and the Pittsburgh,Ft.Wayne and Chicago.Live stock for the U.S.yards is delivered to the Chicago Junction,via the 43rd Street "Y".

The Michigan Central is almost as fortunate as the Rock Island,in the matter of having direct track connections,by means of their Joliet spur,which branches from the main line,midway between Gary,Indiana and Chrisman,Indiana,and running almost directly west to Joliet.The lines crossed which are independent of those crossed by the main line,which terminates at Kensington,Illinois, are the Chicago,Rock Island and Pacific,the Alton,the Wabash,the Santa Fe and the Elgin,Joliet and Eastern.This condition leaves the roads entering Chicago from the west,north-west and north without any direct connections over their own tracks;although their leased tracks gives them the same privileges as if they owned their own tracks.

Even with track connections intermediate carriers are used to quite a large extent in interchanging cars,containing perishable commodities or live stock,which demand extra fast service. For an instance of this type,the Illinois Central delivers all cars containing bananas and other vegtables,destined to points via the Grand Trunk to the Belt Railway,instead of setting out the cars at Harvey,Illinois,where direct track connections may be used.The rapidity of the service afforded by the Belt more than offsets the additional cost.In case the Illinois Central has three cars of bananas for the Grand Trunk,the cost is about fifty percent less to deliver them via the Belt than it would be to make a special run to Harvey and return,which would be,in all about a

forty mile run.

Under the present practice it is estimated that the time required to effect an interchange of a car is about seventy-two hours.The time required for the interchange of high class merchandise,live stock and perishable commodities is,of course,much less,but they are the lesser bulk of the traffic.Lumber,grain,coal and miscellaneous"dead freight"constitute the bulk of the traffic.

The interchange methods that are now in operation by the various railroads in Chicago,having traffic for other roads, destined to points outside the switching district,must be vastly improved soon if satisfactory results are to be expected.Many operating men,and these include the vast majority,agree that the solution to this question,is to interchange all connecting line traffic by means of an outer belt line.It is apparent that to take cars down-town and to have the interchange made where the traffic is most congested increases the time required to effect the interchange.I f the city of Chicago was not to extend its area in the future,the present outer belt system would be adequate,after certain improvements had been made.The best method that seems to have been offered is to build a belt line around the city,so that it would have connections with all the lines that enter the city, at a distance of some twenty miles from the "loop district".This road should be double tracked so that all grade crossings would be eliminated,thus doing away with all the delays which may be directly charged to that cause.

The main classification yards and receiving yards of each road should then be located some distance still further out, so that there would be no backward movement of the car.At this

point all the terminal facilities should be located,such as ice-houses,storage tracks,elevators and warehouses,in addition to the needs that are common to yard operation.

Some years ago,(I899),a plan was proposed whereby all the roads should deliver all of their connecting line business to a general yard,which was designed to serve all roads.This plan was to have the yard perform the functions as a clearing house does for the banking interests.A company was formed and work was commenced in I90I,by the Chicago Union Transfer Railway of Chicago. In I904,the yards were completed and opened for operation,but for some reason or other they have never been used for the purpose for which they were intended.In order to better explain the workings of the plan,the following description will serve to give the reader a broader view.

The Clearing Yards are "summit" yards,that is,they are operated with the assistance of gravity.They occupy a track of land, I3,000 feet long and 670 feet wide,which is connected with all of the belt lines.The general plan consists of two sets of classification yards,each 2,400 feet long,covering the full width of the yard;double ladders at each end,leading away from an artifical summit.There are also overflow tracks,lying parallel to the classification yards,and space has been reserved for storage tracks,repair tracks,ice houses,etc.There are forty-nine tracks alongside each other,which cover the width of 660 feet. Body tracks are spaced I3.3 feet,center to center.The essentials of the track details have no place in this description further than the statement that all of the switches are to be operated from towers with the aid of generated power.

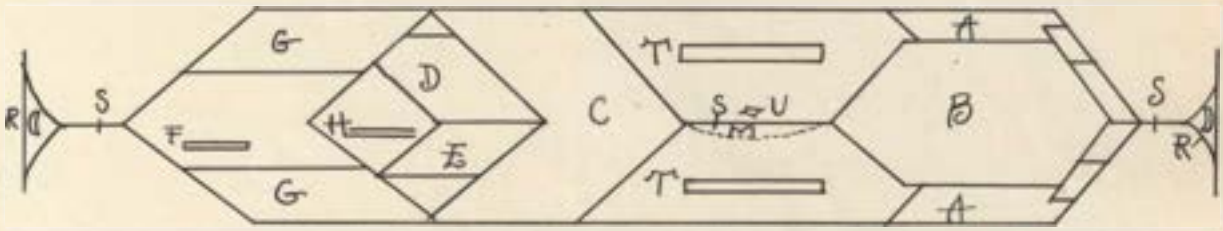
For east-bound movements,trains enter the receiving tracks for that direction,where the engines are cut off and returned by a belt track to the engine house.The cars are then passed over the "hump" into the eastbound classification yard and there assembled and advanced into the westbound advance yard.In connection with this eastbound movement there are caboose tracks,where cabooses are cut off in a convenient way for coupling to the westbound trains.

In handling the westbound movement,trains enter the westbound receiving yards,where the engines are cut off and returned , means of a belt track,to the engine house.The cars are now passed over the "hump" tracks from which they are assembled into trains and taken to the westbound advance yard.Every movement is thus seen to be continous towards destination,and the switching is almost entirely done with the aid of the hump.Fifty trains may be handled daily in each direction,or,3,500 cars each way,representing a total of some 7,000 cars every twenty-four hours.

Should this plan ever be put into operation it would mean a great saving of time,inasmuch as each road is tapped by one or more of the belt lines,having direct access to the Clearing Yards,it would be a very short matter of time for the receiving line to rush a car to the belt connection.It rarely occurs that an incoming train does not have quite a large number of cars for connecting lines,whether they are for Chicago proper or destined to points outside,so the expense item per unit would decrease as the number for connecting lines increased.

A short sketch plan of the Clearing Yards is shown on the following page:

PLAN OF THE CLEARING YARDS.



KEY.

A-Departure Yards	I8	tracks	with a capacity of	I250	cars.
B-Receiving Yards	22	,,	,, ,,	3500	,,
C-Classification Yards	39	,,	,, ,,	3500	,,
D-Storage Tracks	I5	,,	,, ,,	600	,,
E-Fast Freight Yards	II	,,	,, ,,	300	,,
F-Repair Yards	9	,,	,, ,,	I50	,,
G-Departure Yards	22	,,	,, ,,	I250	,,

H-Ice Houses — U-Power Plants

T-Transfer Houses — S-Signal Towers

R-Round Houses — M-Gravity Mound

In the early months of the present year,a very important plan was proposed in regard to the operation of the inner belt system of car interchange.The outlined plan contains provisions an operating company which will lease the Belt Railway and the Clearing Yards.The parties to this contract will be the represena-tives of fourteen roads centering in the city.

The projected company will operate the Belt Railroad and the Clearing yard as a complete unit,and it is expected that

the work and the cost of car interchange will be more thorough, with a decrease in time and cost;and that the character of service will be more satisfactory to all concerned.Mr.Fritch,Chief Engineer of the Chicago Great Western Railroad,has worked out a plan which will include the construction of a new belt line,to be located a few miles beyond the present Baltimore and Ohio Chicago Terminal Transfer Railroad.In addition,there will be constructed three more general interchange yards and the present Clearing Yards will be increased until they have a capacity of twenty thousand cars or four times the size that it is now.

The following abstract was taken from a speech delivered by Mr.Fritch before the Chicago Traffic Club:

"A proper system of interchange in Chicago involves the following:first a continous belt line extending from a point on Lake Michigan,(preferably near Clark Junction,Indiana),passing outside the present belt lines,entirely around the Chicago switching district and terminating on the north near Mayfair,the entire distance being about fifty miles;secondly,direct connections with each railroad crossed by the main line,with ample sidetrack capacity at each junction point to accomodate twenty four hours interchange traffic with each respective line;thirdly,a series of three assembling yards,one near Proviso on the north and one near Hammond on the southeast.The estimated cost of such a system of interchange is $15,000,000,and the average cost per car,on the basis of 3,000,000 interchanged each year,would be 66.6 cents.The cost is distributed as follows:fifty miles of belt track at $125,000 per mile,$6,250,000;yard number One $2,000,000;yard number Two $ 3,000,000;equiptment $750,000;yard number Three $2,500,000,total

$I5,00,000.The annual charges are estimated at $2,000,000 and are distributed as follows:interest at 5%,$750,000;taxes,$300,000; operation and maintenance,$850,000 and incidentals,$I00,000.

Under this scheme the method of operation,the respective railroads would receive and deliver all interchange traffic on the delivery tracks provided for at the junctions of the repective railways,with the main line of the interchange system.The interchange system to handle all traffic between the clearing yards and these junction points and perform all work as assembling and distributing cars in the clearing yards.

CHAPTER THREE.

THE PRINCIPAL BELT LINE AND SWITCHING RAIROADS OF CHICAGO.

I- The Belt Railway of Chicago.

The most important transfer railroad of Chicago is the Belt Railway of Chicago.This road performs transfer service for every railroad,that enters the city,that must deliver cars to a connecting line,where they have no direct track connections.For the Illinois Central,the Belt performs transfer service for all traffic going to the Wabash,Erie,Monon,Chesapeake and Ohio of Ind., Grand Trunk,(perishable only),and for the Chicago Great Western, also cars destined to the Chicago,Milwaukee and St.Paul within the Chicago switching district.The Belt performs transfer service for the Chicago Rock Island and Pacific in interchange with the Chicago,Milwaukee and St.Paul,for all other roads the Rock Island have direct track connections.

In addition to performing an interchange business,both loaded and empty,the Belt Railway serves countless industries at public and private team-tracks or switches.In promoting the road's business,special emphasis is directed to the immense number of choice locations,suitable for all businesses or industrial enterprises.The most importane advantage of being located adjoining the Belt tracks,is the fact that for a nominal switching charge the firm can switch its cars to any railroad entering Chicago.

For the year ending December 31,1907,the Belt Railway operated 125 miles of track classified as follows:

First main track	26 miles
Second track	22 ,,
Siding and yards	77 ,,

The equiptment consisted of the following,all leased from the Chicago and Western Indiana Railroad:

Locomotives	69
Box cars	50
Gondolas	282
Flat cars	42
Cabooses	24

The earnings for the years I906-I907 will show to what extent the road plays in the freight terminal business of Chicago. The earnings are classified as follows:

	I907	I906
Freight Transfers	$2.046,847.33	$I,942,356.3I
Track services	5,I79.57	7,424.83
Rent of equiptment	II2,8I9.38	II3,334.49
Miscellaneous	---26,795.50	40,87I.02
Totals-	$2,I9I,64I.78	$2,I03,986.65

The increse of earning for the year I907 was $87,655.I3 over those of the preceding year.

The ratio of operating expenses to earning were in I907 and I906,54.22% and 52.49% respectively,indicating a slight increase.The relation of the expense of operating service to the earning derived from interchange business are:

Transfer earnings per car,	in I907,$I.9I4;	in I906,$I.758
Operating expenses per car,	in I907, I.III;	in I906, I.000
Leaving a net earning of-	.803	.758

The earnings from the transfer service have slightly incresed over those of the preceding year,a little more than the operating

expenses.The increased operating efficiency of the road increased $00.045 per car,signifying a very good gain,in spite of the marked increases in labor and materials.A very noticeable decrease in loss through freight being damaged,the figures being for I907, $6,823.83,while those for I906 were $9,783.49.

The following statement shows the number of cars handled from I898 to I907 inclusive and a detailed summary by months of the years I906 and I907:

I898	655,04I	I903	863,632
I899	769,985	I904	86I,687
I900	674,374	I905	I,05I.457
I90I	687,236	I906	I,I04,875
I902	844,660	I907	I,069,536

Month	I907	I906
January	90,038	88,244
February	75,549	87,897
March	85,I66	I0I,592
April	87,826	9I,506
May	9I,563	97,37I
June	89,9I0	96,45I
July	86,58I	94,303
August	93,38I	95,467
September	89,846	82,285
October	95,947	90,66I
November	9I,002	88,654
December	92,727	90,444
Totals	I,069,536	I,I04,875

The decrease of cars handled in I907 compared with I906 was

35,339 cars or 3.2%.The number of cars handled during the two years were apportioned among the loads and empties as follows:

	I907	I906
The number of loaded cars handled	60.67 %	58.03 %
The number of empty cars handled	39.33 %	41.97 %

The difference in the number of empty cars handled from the loaded cars is due to the fact that quite a large number of the loaded cars are destined to points outside the Chicago switching district and will be homerouted or loaded for a different road.

2-The Baltimore and Ohio Terminal Transfer Railroad Company.

There is not much difference between the leading belt lines of the city,they may differ slightly in minor details but in general the services performed are very much alike.The business of the terminal railroads differ in many ways from that of the trunk lines and the following reports are very instructive as detailing the amount of business done in one day on one of the large terminal roads.The following reports were received from Mr.F.C.Bachehelder,of the Baltimore and Ohio Chicago Terminal Transfer Railroad and cover all the details of the traffic received and disposed of on January,I0th I9I2.The first report details the train movement and the disposition of the operating forces,while the second report is a summary of the roads business and condition of affairs on that particular day:

January 15 1912

Mr. F. G. Batchelder,
First Vice-President.
Dear Sir:

TRAIN MOVEMENTS, WEDNESDAY, JANUARY 10TH, 1912.

TRANSFER ENGINES.

ENG.	LEFT	ARRIVED	TRAIN FOR	HR.	MIN.	R.R. MILES
397	East Chgo. 7:30 A.M.	East Chgo. 9:00 P.M.	Brighton Pk.	13	30	55
2346	" " 1:00 A.M.	" " 1:25 P.M.	Robey St.	12	25	59
1988	" " 4:00 A.M.	" " 4:55 P.M.	Faithorn	12	55	53
1190	" " 12:00 M.	" " 2:05 A.M.	Barr Yard	14	05	18
1987	" " 12:30 P.M.	" " 7:50 A.M.	Faithorn	19	20	53
2330	" " 2:30 P.M.	" " 3:50 A.M.	Robey St.	13	20	39
2348	" " 6:00 P.M.	" " 9:55 A.M.	Faithorn	13	55	53
1988	" " 10:30 P.M.	" " 1:30 P.M.	"	15	00	53
1971	Chicago 9:00 A.M.	Chgo. 4:00 P.M.	49th & Robey St.	14	00	64
1966	" 2:00 P.M.	" 11:00 P.M.	East Chgo.	10	00	39
	TOTAL 10 TRANSFER ENGINES.			136	30	464

SWITCH ENGINES.

6	East Chgo.	7:00 A.M. to 7:15 P.M.	12	15
395-6	" "	12:00 M. to 1:20 A.M.	13	20
1191	Whiting	7:00 A.M. to 6:25 P.M.	11	25
1192	"	6:00 P.M. to 8:10 A.M.	14	10
36-7	Harvey	7:00 A.M. to 7:55 P.M.	12	55
933	Barr Yard	7:00 A.M. to 6:10 P.M.	11	10
933	" "	7:00 P.M. to 6:45 A.M.	11	45
17	Chicago	7:00 A.M. to 8:10 P.M.	13	10
10	"	8:45 A.M. to 7:30 P.M.	12	45
24	"	8:00 A.M. to 8:55 P.M.	12	55
30	"	8:00 A.M. to 7:15 P.M.	13	15
56	"	7:00 A.M. to 6:10 P.M.	11	10
15-1194	"	7:00 A.M. to 6:00 P.M.	11	00
934-15	"	8:00 A.M. to 9:00 P.M.	13	00
1189	"	7:00 P.M. to 7:45 A.M.	12	45
934	"	6:45 P.M. to 7:05 A.M.	12	20
1194	"	7:00P.M. to 8:20 A.M.	13	20
56	"	7:00 P.M. to 9:10 A.M.	14	10
21	"	7:00 P.M. to10:30 A.M.	15	30
	TOTAL 19 SWITCH ENGINES.		242	30

Average time transfer engines	13 61
Average time switch engines	12 45

	COST OF HDLG.	NO. CARS.	AV. COST PER CAR.
Wednesday, Jan. 10, 1912	$696.93	555	$1.31
Wednesday, Jan. 11, 1911	889.15	630	1.41
Jan. 1st to 10th, 1912	6111.63	4697	1.30
Jan. 1st to 10th, 1911	7968.08	5077	1.81

Cost per car Jan. 10th, 1912 $1.31. Trans. engs. 80¢. Switch engs. 81¢ = $1.31.

Respectfully,
J.L.Nichols.

S.

COPY OF REPORT GIVING
A
SUMMARY OF THE TRAFFIC HANDLED
FOR
JANUARY 10th, 1912.

****

Company Coal on Hand 90 cars

****

Ran 2 trains Whiting to Chicago and return

Ran 2 trains Chicago to Whiting and return

Ran 4 trains East Chicago to Faithorn and return

Ran 1 train East Chicago to Brighton Park and return

Ran 1 train East Chicago to Barr Yard and return.

****

LOADS BILLED OUT-TRAFFIC.

Station	Number Billed	Station	Number Billed
Whiting	115	Riverdale	1
Chicago Heights	7	Faithorn	120
East Chicago	34	Harvey	6
Blue Island	49	McCook	0
Hammond	1	Thornton	0
Chicago	200		

Total loads billed out 533 cars.

THE ILLINOIS NORTHERN RAILROAD.

Another terminal road of some importance is the Illinois Northern,which runs from the lumber district to Elsdon.As an intermediate carrier,handling business from one road to another the Illinois Northern handles about 20,000 cars each year.The road's main source of profit comes from the service that it gives to the industries that are situated alongside its tracks,or in the near vicinity.Prehaps the largest industry served is the Mc Cormick division of the International Harvester Co.,whose traffic amounts to enormous sums in the course of a years duration.This traffic consists of raw materials which are manufactured into agricultural implements

In order that the reader may have some idea as to the traffic rules of one of these terminal roads those rules relating to the charges and more important items ,the tariff issued by the Illinois Northern is given.

Advanced Charges.

This company will not accept carload shipments fron connecting lines with charges collect.Illinois Northern charges must be fully prepaid.

Shipments billed"to order"or"notify".

The Illinois Northern will refuse to accept carload shipments billed to order or notify,when foe movement inside the Chicago switching district.

Reconsignment.

Cars may be reconsigned while in possession of the Illinois Northern for an additional charge of $2.00

Rates.

All carload freight with the exception of several commodities which are named in the tarriff will be subject to a charge of $3.50 per car of 60,000 pounds or less, excess ten cents per ton or fraction thereof.

The above rules are very similar to all of those that have been adopted by the terminal roads, although differing as to the matter of charges and special privileges.

CHAPTER III.

THE FREIGHT TERMINALS OF CHICAGO, ILLINOIS.

Prehaps one of the first ideas of a civil engineer, concerning a terminal, was obtained from the impression that all the work necessary in operating a terminal was to change engines and cabooses, so yards were built along those lines, to the impediment of switching efficiency. It has taken quite a number of years and a great deal of money, used in switching with inadequate means, to instill into the engineers that a terminal is of sufficient importance to cause a little syudy of past, present and possible future conditions, so that the road can handle their business more efficiently, both in regards to the expense and the time involved to move the car to its proper destination. After all, the real and central idea of the operating department is to move the business and all the business that the traffic department can secure for the road by working overtime.

There are quite a number of roads that enter Chicago which have freight terminals that are about as ancient in design as the first locomotive that ever ran on rails. To analyze them, one would almost come to the conclusion that a great many "Just growed", as Topsy did. In our critism we must remember that a few years ago they were sufficient to meet the traffic demands, and judging from the enormous increase of Chicago, in every direction, the most skillfully designed terminal of to-day will be, within the next twenty years, just as far out of style as the ones which were constructed twenty years ago in comparison to the present needs. Another reason why the railroads are slow in installing modern

terminal facilities is the enormous cost and the people are somewhat to blame.The investing public is most concerned about the present rates of dividends,and unless they are getting a good rate of interest on their investment,they are accusing the management of stealing the funds.

The terminal problem is becoming one of the most intense studies among operating men,connected with the operating departments of the roads that center in Chicago.However delays are which are caused by inadequate facilities are costly and the freight terminal situation demands immediate attention to the solution of the problem.To delay will mean additional cost of operation and the character of the problem will become more and more difficult.

The present tendency of the roads that enter Chicago is to build their terminals within the inner zone of the switching district.A glance at the map of the terminal district will show that about 90 % of the large yards are so located;for instance,the Illinois Central main receiving yard is at Fordham,eleven miles from Randolph Street,as is likewise the main yard of the Pittsburgh, Ft.Wayne and Chicago,which is located at 55th Street,or,the Lake Shore,which is located at Englewood,both of which are not more than eight miles from the heart of the city.The Hawthorne plant of the Chicago,Burlington and Quincy is located some ten miles from the Union Station.One might say that all of the main terminal plants of the trunk line railroads are located within the inner limits of the Baltimore and Ohio Chicago Terminal Transfer Railroad.

In order to secure the best possible interchange,it is necessary that the length of time required for the operation be the minimum and this means that the traffic should pass outside the

city limits.At present ,the Belt does a heavy interchange business with all roads and a survey of its location will show thatit runs in a very congested portion of the city,which requires slow running and delays due to the grade crossings with other roads.For an instance of this,the grade crossing of the Belt and Illinois Central is a typical example of the delays which are very frequent.It has been noted that on more than on occasion,by the writer,that a train has been delayed as long as from three to forty minuits.The delays are most frequent in the early morning hours or in the lats afternoon periods.

It is true that the enormous increases in traffic has overtaxed the facilities,which,while the railways have added to their properties,the improvements have not equaled the developments of the traffic.In fact,the rapid building up of the city has made it impracticable,in many instances,for the railways to extend their present terminal.Facilities in the elevated sections of the city which were formerly available for freight traffic are now needed, most urgently,to take care of the immensely increasing passenger traffic and local freight house business.

The necessity for relieving the downtown facilities of freight traffic is beyond dispute.A certain part of the traffic, such as the freight house business and carload business for patrons located in the down town district must necessarily use the overtaxed terminals,and no relief can come from the shifting of interchange traffic.

It is estimated that there are now being received in Chicago,approximately 4,000,000 loaded cars each year,of which about 775,000 loads is business to points beyond Chicago.About an

equal number is business to points within the switching district and interchange traffic.It is thus apparent that relief,from the crowed conditions of Chicago,not only now but in the future,must be obtained by separating the interchange traffic moving to points beyond Chicago from the interchange traffic destined to points within the switching district.

The inside yards of the city can now take care properly, of not more than the interchange traffic destined to Chicago proper and such yards should not be burdened with the business moving to points beyond.The Terminal Officers Association has recommended that all lines having interchange traffic separate it from the the local business and that they make their deliveries to connecting lines through channels that will keep the two classes separate.

The matter of freight house location is another very important detail to consider inasmuch as the railroad that has its freight house located near the center of the business heart of the city will command the major portion of competitive business. There are two contrasting methods of freight house location to be seen from a study of the freight house problem of Chicago;the ones which are concentrated in one large plant and that plan of providing numerous depots,whereby,the merchant may deliver to several within a short radius.A very striking example of the first,is the local freight house of the Illinois Central.The only place where L.C.L. business is handled is at the South Water Street station, and the road has concentrated all of its facilities there,such as, fruit houses,in-bound and out-bound freight houses and all loading platforms.At this point direct connection is made with the various steamship lines plying on the Great Lakes.Dock houses of

the terminal serve to act as store houses for freight awaiting the arrival of the steamer during the period of navigation and during the winter months they are used as store houses for other classes of freight, just as the occasion demands.

As a contrast to the Illinois Central method we have the type of freight houses that are located along the Chicago and Northwestern. Instead of having only one very large freight house serving the entire city, this road has a large one and in addition a chain of several smaller ones. This policy enables the shipper having a plant several miles from the downtown district to have very good facilities for the reception of his freight. This is a very good plan and the expense involved is not great enough to make it very costly, for the sub-stations need not have all the facilities that the main depot has. One large icing house will very easily handle all the business that these stations have to offer, and the billing can be done at the central office, thus decreasing the cost per unit, which is charged to the traffic and accounting departments.

In discussing the two metods of freight house location, the character of the district through which the road runs, must be considered. It will be remembered that the first named road runs through more of a residential district than does the Northwestern, which passes through the industrial section of the west and northwest sides of the city. There are only a few industrial plants located adjeacent the tracks of the Illinois Central and these are either located at the extreme north end of the line or south of 90th Street. Most of the industries which are served by the Illinois Central are located near the 26th Street district and the business

of these plants is ,in nearly all cases,of a car load nature.The Chicago and Northwestern has more industrial plants to serve than does any other road that enters Chicago,switching lines included. At present there are nearly three hundred industries,situated in the western and northern portions of the city,which are totally dependent on the service of the Chicago and Northwestern to handle their traffic.Unlike the industries along the Illinois Central, the industries of the Northwestern are scattered from the city limits to the very heart of the city and many of these plants have a strictly L.C.L.business,while others send out carloads.

The South Water Street local station of the Illinois central would have a very excellent site were it not for the fact that there is only one approach to their facilities.Blocked on the east by the lake and on the south by the tracks and on the north by the river,there is only one possible approach and that is from the west.There are three freight house terminals within a stones throw in the South Water street district and the passing of the teams and trucks to and from these stations tend to cause a congestion and delays are reacted in the loading and unloading at the railway stations.

A very serious objection to the local freight house location of the Santa Fe is the matter of the approach.Patrons of the railways should not be compelled to cross such an outlay of tracks as those who use the Santa Fe freight station.The tracks leading to the Dearborn Street Station pass within a short distance from the freight house and only those patrons situated on the east side of the house are able to deliver freight without having to cross the tracks of the Chicago and Western Indiana,leading to

the Dearborn Street Station.Delays which are the result of waiting for the gates to be raised are inexcususable and the railroad should should not allow itself to be guilty of such a poor terminal.The elevation of the passenger tracks,in the near future willremedy this fault but the present conditions have existed for years.

There is another very important element in the handling of local freight and that is the tunnel ahich is operated by the Illinois Tunnel Co.This is exclusively a freight tunnel designed to act as a medium for the interchange of commodities from the large stores of the downtown district to the various railroads,and to perform other business of a miscellaneous character.By the use of this tunnel,the roads are enabled to care for the business of the stores of the loop district,while their freight houses may be located some distance from them.There seems to be quite a disadvantage to this method and that is the higher cost of handling, which is about 33 ⅓ of the cost which the railroads pay in the handling of a ton of L.C.L.freight through the ordinary means.

There has been a method suggested which would,if built and put into operation,reduce the congestion and would simplify the handling of the L.C.L. business,destined to other roads as well as from the large merchandise establishments to the railroad stations.Mr Delano has suggested that the freight should be moved outward to the less densely settled sections,where adequate facilities could be had more cheaply and where a more economical loading of cars may be had.The ideal way would be for the city to own and operate a subway under the wholesale and retail districts, having stations every few blocks where freight might be received.

The freight is then to be moved to the outside stations by means of a continuous conveyer,at a slow rate of speed,received and a receipt given by a duly authorized agent.Then is has arrived at the freight house,it will be assorted for the various lines.

CHAPTER IV.

TYPICAL METHODS OF TERMINAL OPERATION OF THE TRUNK LINES OF THE CITY OF CHICAGO.

The common practice of yard terminal location, by the trunk lines that enter the city of Chicago, is to have them located some distance from the heart of the business district. Most of the main yards are, however, located within the inner belt lines, and are not usually more than eight or ten miles from the loop district. The main yard of the Illinois Central is located at Fordham, a distance of some eleven miles from Randolph Street, and north of the Belt Railway crossing, that of the Chicago and Northwestern is located at Proviso, which is just outside the Indiana Harbor Belt Railway.

For the purpose of treating the terminals of the trunk lines, centering in Chicago, the Chicago and Northwestern and the Illinois Central will be used for illustrating the points referred to. In the main the terminals of all the trunk lines are operated very much alike, with the exception as to the detail in regard to the handling of routine matters, or, of special classes of freight that is peculiar to that particular line. That the terminals of most of the roads that enter the city are inadequate is admitted. It cannot be said that any one method will solve the problem, but numerous steps will be required in order that the final solution may be derived.

The organization of the terminal is somewhat similar in all cases. Practically every road organizes its terminal into a well defined district, it usually extends some distance from the heart of the city, in order that, all movements may be better controlled. The Illinois Central organizes its terminal into a dis-

trict which extend from Randolph Street to Matteson,Illinois,a distance of some twenty eight miles.The Northwestern terminal district extend west so as to include the new terminal at Proviso. It is almost essential that a road that does any terminal business to speak of should create such a district,very much like a division and place a separate organization in full charge.If the business is large enough,a terminal superintendent may be put in charge.The question was once asked as what kind of a man it took to handle a large terminal and the answer was-"The kind of a man who can run the United States Government".

The Chicago and Northwestern and the Illinois Central both do a very large passenger and freight terminal business,although the former does not lease any their facilities as does the latter.The Michigan Central,Big Four and the Soo line ,all lease terminal facilities from the Illinois Central,both as regards to passenger and freight traffic.In addition to this,the Illinois Central as well as the Northwestern,make a special effort to handle suburban passenger business and they have developed this special phase,so that they are giving excellent service.The first named road does more of a variety of terminal work than does the latter and they therefore,have need for a more complicated organization than does the Northwestern.

The internal organization of the Illinois Central terminal district is headed by a superintendent of terminals,assisted by a superintendent of freight terminals and two trainmasters.The superintendent of terminals is in charge of the passenger traffic and the matters relating to the handling of freight traffic is left to the superintendent of freight terminals,except on matters

relating to the general policy.On the Northwestern,the terminal is governed by a trainmaster of terminals,who has charge of the freight department.The division superintendent has jurisdiction outside the terminal,but the division is corparatively short. The Chicago and Rock-Island leases terminal facilities and their organization more closely follows that of the Illinois Central,the terminal being operated under the direction of a superintendent of terminals.

Frequent interviews with the managers of manufacturing plants and other industries,requiring special terminal facilities and service,are necessary in a district of the size of the Chicago terminal district.These conferences require a great deal of time and patience,so that it almost compels the road to place their terminal into a well defined district,with a man in charge that has power to arrange these details.An agent or trainmaster usually is obliged to report to his superior officer before anything definite can be agreed upon.We may say,that in regards to the general scheme of organization of terminals,the trunk lines are very complete.

As heretofore stated the terminals are behind the times in the character of their terminal facilities.Most of the roads have been required,within the past decade,to build additional yards in order to handle the increasing bulk of freight traffic. A few of the trunk lines have made it a practice to handle certain commodities in distinct yards.The Illinois Central uses a yard, of some 2500 car capacity,exclusively for the handling of commercial coal.The Northwestern has set aside certain facilities for the milk and other dairy products.

For a more detailed example of terminal operation,the Illinois Central terminal is composed of some five freight yards, and the smae is true of the Chicago and Northwestern,with a series of seven yards.The yards of the Illinois Central are located at the following point:Wildwood,Burnside,Fordham,South Water Street and a smaller one at Hawthorne.Those of the Northwestern are located at Proviso,Wood Street,Western Avenue,Grand Avenue,North Avenue,Deering,Mayfair and 40th Street.Since the Chicago terminals are naturally obliged to bear the greatest burden of the odds and ends,which necessites expensive switching,it is apparent that special provisions must be set aside.A road is obliged to hold at all times,a large number of cars for"over head"billing,charges, routing,disposition and other miscellaneous reasons.Furthermore, the wide variation in the character of traffic ahndled will,very frequently,require specail yards for that use.Storage yards are in demand in all times of the year,both for empties and loaded cars awaiting final disposition from the consignees.

It may be of some interest to know how the Illinois Central and the Chicago and Northwestern divide their terminal divisions.The five yards of the Illinois Central,doing strictly a freight traffic business,are used for different purposes.The Wildwood yard has a capacity of some 2500 cars and it is here that the great coal traffic of the Illinois Central is handled. Fordham Yard,at Dauphin Park Station,is the most important yard of the terminal system.This yard has a car capacity of 3500 cars and all commodities,with the exception of commercial coal,fruits and merchandise for Chicago proper,and fruits for the Northwestern, are handled.The Chicago Yard,at South Water Street,consists main-

ly of public teamtracks,dock house tracks and those serving the various platforms and freight houses.Into this yard,all freight from the West is received and classified,as well as the making up of west-bound trains.Most of the manifest trains,which are sent south in the early evening,are made up in this yard.

The principal disadvantage of the Chicago Yard is the lack of the proper space,the congestion of traffic being due to the fact that there are all the varieties of transactions,which are peculiar to freight carrying.The suburban passenger business breakes in on the freight and the down-town yards are always full of cars waiting to be unloaded at the various freight houses.In addition,there are trains going or coming on the roads which have leased privileges.It has been wondered how railroading could be done under those circumstances,leaving out the matter of expense.

The Chicago and Northwestern has just completed a very well designed yard at Proviso,a distance of ten miles from the Chicago River.This yard is one of the most modern of any yard that has been recently constructed in the Chicago terminal district. It has a capacity of 10,000 cars and was originally divided into three units.This yard is being used for all purposes,unlike the Wilwood Yard of the Illinois Central.The Wood Street Yard is some five miles from the loop district and is regarded as the vital point of the terminal,it being more sensitive to blockades and minor congestions.Cars are rarely in this yard for more than five or six hours,and much less for perishable commodities;the only exception being when the whole terminal is suffering from congestion.On account of its strategic location,deliveries can be made to most of the roads that enter the city.Both ends of the

yard are used in effecting interchange with connecting lines,both in regards to the handling of passenger equiptment and general freight traffic.The average daily interchange numbers about 1600 cars.

The interchange of traffic,by means of direct track connections or with the assistance of an intermediate carrier,is usually carried on from all the yards of the terminal.On the Northwestern,the chief yards handling the interchange business are those at 40th Street and Wood Street.The south yard of the Wood Street Yard is the receiving yard for this interchange business and it is here that the cars are properly classified and sent to their destinations-whether it be to another point on the terminal or to a station outside the switching district.At 40th Street, traffic is interchanged with all the industries,via other yards, and with the Belt Railway.The total number of cars interchanged between the two roads average about 750 per day.These cars consist mainly of those destined to other roads who do not have direct track connections with the Northwestern,or else, the time element becomes the governing factor.

Interchange with connecting lines is similarly conducted on the Illinois Central.The major portion of interchange business is done at Fordham where the Belt,Rock Island and all roads reached via the Belt are received and forwarded.

The facilities of the trunk line terminals differ very greatly in comparison with the different roads studied.They all contain the usual layout of tracks and yard units,consisting of receiving yards,classification yards,departure yards,and storage yards,all more or less perfect in regards to design.

Classification yards are the most important features of the proper yard design and plenty of space should be provided for their use.The purpose of a classification yard is to put the cars of different destinations into some organized and regular order.The cars of each destination should be switched,in the classification yard,in the order required for delivery.If the cars are to be separated,accordingly to the classes of commodities the cars are ladened with,the cars of each commodity should be further assorted by classes or grades.Gravity switching has been found to be of great assistance as regards to the saving of money and time.A grade or summit,placed just at the head of the classification yard may be of great assistance if the traffic is heavy. The scales should be placed on the summit so that the extra movement of weighing each car may be avoided.The movement of a car over the "hump"is about that of the natural walk,so that there is no inconvenience caused when the weighing is done in this manner. The train which has been received from off the line may be marked and taken to the classification yard directly after it has been received.The waybills should then be sent along with the cars so as when the cars pass over the scales the weighmaster may stamp the bills with the proper weights.

Very few roads entering Chicago has gravity switching plants.The best example of this method is to be found at the Hawthorne Yard of the Chicago,Burlington and Quincy.Is has been found that this method works very well in ordinary times when the temperature does not become extremely cold.The Northwestern does not have a gravity switching yard through out its entire system.

The Illinois Central has no gravity system in use,but at Fordham,use is made of an assisting grade at the head of the classification yards.The scales are placed at the entrance of the general yards and the train must pass slowly over them before entering the receiving yards.

Most ,if not all,classification yards of the trunk lines are operated by means of hand thrown switches.It is apparent that a mechanical thrown switch,controlled by an operator,at the entrance of the yard where,he might see the carding of each car, and thus set the proper tracks;would be quite an advantage.The switches leading to the various tracks of the Clearing Yards are built to be operated in this manner.

The location of bad order and repair tracks is especially important.A careful distribution of them may mean the saving of many hours time,if they are distributed at the strategic points of the general yard.The repair tracks should be short,not to exceed the capacity of fifteen or twenty cars.In many instances,cars requiring the exchange of trucks can be shunted to these repair tracks and a new set may be put under them within a few moments. These facilities may mean the saving of several hours of time,for if the car has to switched out nad taken to the general repair track,it will be subject to a delay of several trains.In cases of cars loaded with perishable commodities or of live stock this system would be of special benefit.The practice of the Illinois Central,at Fordham,is to take the cars to the general repair yard which is located apart from the general yards.

The coaling stations and water towers,which are used by the switch engines on the terminal,should be located at the yard

where the largest number of engines are working.The proper location would be the place most accessable,with few tracks to cross. At Fordham,the chutes and water towers are located some distance from the working portions of the yards and in order to reach them an engine must cross quite a large number of tracks.

The matter of the proper location of icing plants means much in terminal operation.There seems to be several types of ice-house location to be found in Chicago.Some roads place their houses near the main freight houses and other place them near the principal classification yard.The Illinois Central follows the plan of having their ice house located according to the first mentioned plan,while the Northwestern has their icing plant at the 40th Street Yard.Often,it happens that a car of perishable freight reaches the main yards with little or no ice,or,the car may be in a very bad physical condition.In these instances it would be necessary,under the first plan,to take the car downtown to refill it or transfer its contents into another car,thus requiring an extra trip to be made.

The car record system of the freight terminal is one of the most essential items of operation,not merly for the information of the shipper,but to enable the operating officials to inform themselves as to the general condition of the terminal.Some abuse of car record keeping has crept in,and an official should be careful not to overdo the thing;ending up by having a lot of useless reports lying on his desk every morning.The usual practice of the Chicago terminal offices is to have a special set of clerks engaged solely with the work of preparing the necessary reports and keeping the proper terminal records.

The terminal reports consist mainly of the following types:trian sheets,transfer reports,live stock reports,interchange sheets,yard reports,track reports,cars received and disposed of sheets,reports showing the cars on hand-variously classified,reports concerning the commodities on hand according to their destination,cars for connecting lines,engine reports,labor time sheets and other of miscellaneous character.It is absolutely essential that every car entering or departing from each yard should be carefully checked,so that at any time the exact location of a car may be ascertained.

The policy adopted by the Illinois Central is to have all the tracks of each yard checked during the early forenoon;the cars being checked as they appear on the respective tracks.The car number and initial,contents and carding of each car is noted.By twelve o'clock,the yard clerks have finished their tasks and the entire yard has been checked so that the exact location of a particular car may be easily found.By comparing the cars location of today with the reports covering the previous day the movement may be checked and noted.

Each train,whether road or transfer,entering the yard is checked and a train sheet is made out showing the train number, conductor,engine number,car number and initial,whether loaded or empty,seal records and the carding.These train sheets are sent to the car record department where the numbers are entered in either the foreign or local car record book.

The following reports are inserted to show how a yards condition may be quickly and at the same time be accurately found. These reports are the ones used by the Illinois Central and copies

Illinois Central Railroad Company.

Daily Report of Cars Received and Disposed of on Chicago Terminal District,

Dec 20th 1911

CARS RECEIVED, CLOSING 11:59 P. M., Dec 20 1911

	LOADS	EMPTIES	TOTAL
eceived from South, at Flossmoor,	432	50	482
" " West, at Hawthorne,	157	27	184
" " All Other Roads,	321	487	808
" TOTAL,	910	564	1474
" Yesterday,	920	428	1348
" Same Day Last Year,	868	500	1368

CARS DISPOSED OF

	LOADS	EMPTIES	TOTAL
rwarded South, via Flossmoor,	370	401	771
" West, via Hawthorne,	124	129	253
" to All Other Roads,	573	189	762
" TOTAL,	1067	719	1786
" Yesterday,	900	576	1476
" Same Day Last Year,	1072	620	1692

Engines Worked 73 - 17/20 1910
" " 62 - 17/20 1911

1786
1476
310
160
12
36

Illinois Central Railroad Company.

Daily report showing total number of cars and commodity on hand on Chicago Terminal District at 12:00 o'clock noon, Dec 20th 1911

	WILDWOOD	FORDHAM	CHICAGO	HAWTHORNE	TOTAL	YESTERDAY
Coal for orders	301	8			312	387
Coal for T-tracks-Industs.	31	21			55	70
Coal for connecting lines	52	2	4		58	114
Coal for unloading		5	273		278	282
Train for inspection				8	8	
Train for disposition		42		41	83	116
Train for connecting lines		18			18	1
Train for elevators						
Lumber for orders	3	42			45	66
Lumber for connecting lines		24			24	25
Miscellaneous for orders	4	93	24		121	129
Miscellaneous for T-tracks	5	41			46	28
Miscellaneous for connecting lines	8	44	34	6	92	73
Miscellaneous for unloading		92	414		506	486
Coal freight on hand						
Big Four loads for orders						
Four loads for transfers						
Loaded Interchange	8	23	11	5	47	57
Company material	5	42	2		49	96
Company coal, Chicago		54	80		134	161
Company coal, Burnside	1	20			21	34
Bad order, outside Burnside	8	298	55		361	360
Empties for loading, West Yard		49	238		287	280
Empties for loading, team tracks		12	21		33	35
Empties for Connecting lines	1	29	5		35	39
Empties for forwarding	1	254	10	24	295	256
Loads for forwarding	5	86	20	1	112	93

TOTAL CARS ON HAND AT 12:00 O'CLOCK NOON.

	CAR CAPACITY	LOADS 1/10	EMPTIES 1/25	TOTAL 3/15
Wildwood	2500	479	16	445
Fordham	3500	657	642	1299
Chicago	2000	862	329	1191
Hawthorne	300	61	24	85
Burnside	1000	188	789	977
Total		2387	1975	4362
Total Yesterday		2514	1910	4424

Illinois Central Railroad Company.

Daily Report of Loaded and Empty Cars on hand on Chicago Terminals for Connecting Roads, at 12 Noon, Dec 20 1911

	At Wildwood	At Fordham	At Chicago	At Hawthorne	TOTAL	TOTAL YESTERDAY
Chicago, A., T. & S. F.,	4		1		5	16
B. & O.,		1			1	8
Belt Ry.,	4	7			11	143
C., B. & Q.,	17	33			50	21
C. G. W.,						
C., I. & L.,						
Chicago Jct.,	14	7		6	27	191
C., M. & St. P.,						
C., P. & W.,						
C., R. I. & P.,	2				2	16
C. T. T.,		2			2	18
C., L. S. & E.,						
~~C., W. P. & So. Ry.,~~		3			3	8
C. & A.,			1		1	1
C. & E. I.,		1			1	6
C. & N.-W.,	5	2	12		19	85
Erie,						
Grand Trunk,						
Ill. Nor.,		1	20		21	141
L. S. & M. S.,		2			2	27
~~Lake Mich. Car Ferry T. Co.,~~		1			1	17
Mich. Cent.,		9	1		10	17
N. Y. C. & St. L.,		12			12	12
Pull. Co.,	2				2	19
P., Ft. W. & C.,		1			1	18
P., C., C. & St. L.,		4			4	6
Wabash,		8	8		16	45
Wis. Cent.,						
IHRy	5	23			28	66
TOTAL.	53	117	43	6	219	762

will be found on the desks of the operating officials early the following morning.

An analysis of the reports will show that there has been an increase in the number of car arrivals,over those of the preceding day and for the period of last year.The total number of cars handled has also increased over the two named periods.The cars received from connecting lines are of considerable numbers,the percentage being a little over 54 % of the total number of cars received on the terminal.Of these cars,the greater percentage are for southern stations,some are for industries located within the Chicago switching district and a few are for the public teamtracks. The Illinois Central has adopted the policy of declining to accept cars destined to public team tracks,north of Grand Crossing,without the consent of the General Freight Department.Many cars of L.C.L. freight are received from connecting lines for points on the Illinois Central and the policy is to deliver them to a transfer platform,where they are worked according to their destination. For example,the Michigan Central usually sends in several carloads of this class of freight,as does the large mail order houses like Mongomery Ward and Co.

Deliveries for connecting lines were 762 out of a total of I786 cars disposed of.This represents about 42% and 75% of which wre loads and the remainder empties.The movement westward is about equal,as regards loads and empties.The large number of empties moving south represents a normal situation,indicating that the cars are being home-routed.Further it is an indication that there are plenty of empty cars on hand to fill the car orders.

The second report is a very detailed statement concern-

ing the loaded cars on hand,classified according to commodities. Sereral of the most striking features are the following items: commercial coal held for orders at Wildwood,commercial coal for unloading placed at the tracks of the consignees,grain held for inspection,lumber held for orders and miscellaneous loaded cars awaiting unloading at South Water Street.

Comparing the total number of cars on hand with the total yard capacity,it is seen that it is less than 50% of the latter. A decrese of some 2I2 cars on hand will be noted in comparing the situation of the twentieth,with that of the nineteenth.The number on hand is lower by some 500 cars than it usually is for corresponding periods of other years.

The report showing the number of cars on hand for connecting lines is very important.Comparing with the previous day's report,there seems to be a very large decrease,indicating that measures have been taken,within the last twenty-four hours,to clear the yard.At present,there are only about two or three cases where trains could be made up of sufficient tonnage to warrant a transfer to be run.

Thus it will be seen that with these repots at hand the condition of the terminal may be readily seen and furthermore, it will enable the operating official to know what measures are necessary and in what direction they should be directed.

Roads doing a very great deal of business for the industries located alongside their tracks are very likely to become congested at certain points,due to several reasons,and in order to protect themselves and better the controll of the situation, an embargo bureau is generally established.The Chicago,Milwaukee

and St.Paul,on account of the vast number of coal yards and large coal using industries,located on its tracks,has placed a permanent embargo on all commercial coal.The embargo is a refusal to accept any car until special permission has been secured from the road issuing it.In the case of a very heavy traffic the embargo system is a very decided advantage,both to the consignee as well as to the railroad.For the former,the business is regulated systematically and no firm is given more than 48 hours supply of cars,to load or unload at a certain time.(This is the practice of the Chicago and Northwestern).Demurrage charges have nearly always been found to be inadequate,but the railroads have benefited from the embargo system,not with the revenues derived but from being able to serve all industries at all times.

Before the embargo system was adopted,the terminals were congested and not withstanding the fact,that a few of the larger industries were able to get sufficient cars;the service they received was very inferior to what they now receive.Another advantage of this system,is that the business for industries is received in regular quantities,thus reducing the number of hold cars and increasing the switch engine efficiency.

Train Movements in the Yards.

The movement of a train through the various yards of the terminal is a very interesting feature of the operation of a large railway terminal.The following,is a description of the manner in which trains are handled on the Chicago terminal district and is very similar to the methods adopted by the other trunk lines.A train consisting of "dead freight",with a few cars each of commercial coal,grain and other commodities of a miscellaneous char-

acter will be traced from the point that it reaches the terminal until the cars have been classified in the classification yards.

Not until Manteno is reached,a station some 47 miles from Randolph Street,does the trainmaster receive a consist report, or,what is know on the terminal as a "39" report.This report is made by the conductor of the train and is left with the agent at Manteno,who telephones its contents to the trainmasters office at Fordham Yards.For reference a blank form is show on the following page.The report contains the train number,the number of the engine, the name of the conductor,the number of loads and empties properly classified.When this report is received at Fordham,a copy is given the general yardmaster and he usually has plenty of time to arrange for the receiving of the train.It often requires from an hour to an hour and one half for a train to reach Fordham after it leaves Manteno.

After leaving Manteno,the train proceeds to Harvey,Illinois,where dead freight destined to points via the Grand Trunk are set out.The train next proceeds to Wildwood,where the train passes over the scales of the Western Weighing Association.At this point,all cars of commercial coal and cars destined to the following lines are set out:Pere Marquette,Pittsburgh,Cincinnati, Chicago and St.Louis,Indiana Harbor Belt and the Baltimore and Ohio Chicago Terminal Transfer Railroads.All carload freight for the Chicago,Milwaukee and St.Paul,destined to points outside the switching district,is also set out at Wilwood,where it is delivered to the Indiana Harbor Belt.

When all the business has been completed at the Wildwood Yard,the train moves to Fordham,into the receiving yard.

Illinois Central Railroad Company.

NORTH BOUND "39" REPORT TO BE LEFT AT MANTENO.

For Train Master Freight Terminals, Fordham,

Train No. _____ *Eng. No.* _____ *Conductor* _____ *Time* _____ *m.* _____ *191*

LOADS _____

EMPTIES _____

Operator Manteno must send this report to Fordham promptly. Operator Fordham must notify Chicago Yard promptly by telephone of Live Stock and Perishable Freight for that yard.

FOR		FREIGHT	LOADED CARS.											EMPTY CARS.			
			LIVE STOCK	LIVE POULTRY	BANANAS	FRUIT AND VEGETABLES	OTHER PERISHABLE	MERCHANDISE	OIL	OTHER MANIFEST	GRAIN	COAL	OTHER DEAD FREIGHT	I. C. BOX	BIG 4 BOX	MISCEL.	BAD ORDER
			A	B	C	D	E	F	G	H	I	J	K	M	N	O	P
U. S. YARDS (Via Fordham)	I. C. CHUTES	1															
	QUARANTINE CHUTES	2															
	CONN. LINES	3															
CHICAGO	PROPER	4															
	CONN. LINES	5															
	FREEPORT DIV.	6															
FORDHAM	PROPER	7															
	COMPANY	8															
	CONN. LINES	9															
KENSINGTON	PROPER	10															
	CONN. LINES	11															
WILDWOOD	PROPER	12															
	CONN. LINES	13															
HARVEY	PROPER	14															
	CONN. LINES	15															

Position in train of Live Stock for U. S. Yards and Loads (A to H) for Chicago.

No. 17 _____

Perishable Freight for Connecting Lines :

No. 18, via Chicago.

No. Cars.	Contents	Railroad via
A	B	C

No. 19, via Fordham.

No. Cars.	Contents.	Railroad via
A	B	C

No. 20, Cars Race Horses.

A _____ *Hawthorne.*

B _____ *South Chicago.*

☞ CONDUCTORS:—For Special Instructions and Connecting Line Deliveries, see other side.

SPECIAL INSTRUCTIONS TO CONDUCTORS.

These instructions refer only to the handling and reporting of cars in north-bound trains and are printed here for handy reference by Conductors. They are subject to change at any time by Bulletin order.

1. Report Dead Freight for U. S. Yards proper in No. 1; cars for South Chicago Branch, Hyde Park and Grand Crossing in No. 7; cars for Blue Island Branch in No. 10. Grain billed to Chicago, and all empty cars billed to Chicago, U. S. Yards or Fordham, in No. 7. Coal bills to Chicago in No. 12.

2. In Nos. 18 and 19, when name of Railroad or Fast Freight Line is not shown on billing, give destination of freight and initials of cars in column C, and handle cars as directed by Fordham yard office.

3. All Live Stock, Dead Freight and Empty Cars for U. S. Yards must be set out in Fordham yard, but when so instructed by yardmasters, road trains must take Live Stock to U. S. Yards.

4. All cars loaded with Live Stock for U. S. Yards must be weighed, both loaded and empty.

5. Live Stock for connecting lines, when taken to U. S. Yards by road-trains, must be placed on the track opposite our chute-track, which is known as "Pan Handle Middle," for delivery by U. S. Y. & T. Co.

6. All loaded cars and empty stock cars to be weighed, must be weighed in the track scales located in track No. 6, just south of Fordham yard. Make a report on Form L. F. O. O 124 Special, of all cars in train in the order in which they will pass over scales, and hand to weighmaster before commencing to weigh.

7. Loaded cars for Chicago, reported in columns A to H, must be taken to Chicago, unless ordered set out in Fordham yard by yardmaster. All other loaded and empty cars for Chicago, must be set out in Fordham yard.

8. Cars for the M. C. R. R. at Kensington must be delivered on track No. 1 in the M. C. yard south of the depot; cars for G. T. at Harvey must be delivered on extreme east track north of railroad crossing.

9. Cars for A. T. & S. F. and Ill. Northern and Company coal billed to 27th street should be used to fill out what trains operate through to Chicago and must not be set out unless otherwise ordered.

10. All business originating from the South for the C. M. & St. P. Ry., destined beyond the Chicago Switching District, should be set out at Wildwood and delivery effected to the Ind. Harbor Belt at that point. Cars for the Switching District should be delivered to the Belt at Fordham.

11. Deliveries to Connecting Lines are made as follows and cars must be set out in yard from which delivery is made, regardless of station way-billed to:

ROAD	COMMODITY	SET OUT YARD	ROUTE
A. T. & S. F.	All	Chicago	St. Charles Air Line.
B. & O.	"	Fordham	South Chicago.
B. & O. C. T.	"	Wildwood	Riverdale.
Belt. Ry.	"	Fordham	Direct.
C. & W. I.	"		
C. S. L.	"	"	Direct.
C. I. & L.	"	"	Belt Ry.
C. & A.	"	Chicago	St. Charles Air Line.
C & E. I.	"	Kensington	Direct.
C. & N. W.	" Live Stock and Per.	Chicago	St. Charles Air Line.
C. B. & Q.	" Dead Freight	Fordham	U.S. Yards, Ashland Av.
C. J. Ry.	"	"	Direct.
C. G. W.	"	"	Belt Ry.
C. M. & St. P.	" Des. Chicago, Sw. Dis.	"	Belt Ry.
"	" " Chicago, Beyond "	Wildwood	Ind. Har. Belt.
C. R. I. & P.	"	Fordham	Burnside.
C. & I. W.	"	Chicago	Direct via Hawthorne.
C. & O. of Ind.	"	Fordham	Belt.
C. W. P. & S.	"	"	Direct.
C. R. of Ind.	"	"	U. S. Yards, Ashland Av.
E. J. & E.	"	"	South Chicago.
Erie	"	"	Belt Ry.
G. T.	Live Stock and Per.	"	Belt Ry.
"	All Others	Harvey	Direct.
Ill. No. Ry.	All	Chicago	St. Charles Air Line.
Ind. Har. Belt. Ry.	"	Wildwood	Highlawn.
L. S. & M. S.	"	Fordham	U. S. Yards, Ashland Av.
M. C.	"	Kensington	Direct.
Mfgrs. Jct.	"	Chicago	Direct via Hawthorne.
N. Y. C. & St. L.	"	Fordham	Direct.
P. M. Ry.	"	Wildwood	Riverdale.
P. C. C. & St. L.	"	"	Riverdale.
P. F. W. & C.	"	Fordham	Grand Crossing.
Soo Line.	"	Chicago	Direct.
U. S. Y. & T. Co.	"	Fordham	43rd Street.
Wabash	"	"	Belt Ry.
Wis. & Mich.	"	"	Belt Ry

FORDHAM APRIL, 1896.

Re-issued March 6, 1897.
Re-issued June 6, 1898.
Re-issued Feb. 22, 1903.
Re-issued Aug. 21, 1905.
Re-issued Jan. 5, 1911.

At Forham,the conductor registers and passes his waybills to the train desk clerk,who scrutinizes each waybill carefully,seeing that the weights are authorized by a gross,tare and net weights; also ascertains,whether he has received any orders relative to the disposition of each car.If the car is destined to a point outside the switching district,the train desk clerk routes the car to the proper intermediate carrier and if the shipper has failed to give the final route for the car to travel,he must route the car to its best advantage.If the car is destined to a point within the switching district,care must be taken to see whether or not the consignee is on the credit list and if he is not on it,the car must be carded hold.Switching charges must be prepaid and charges must be collected by the trun line receiving the freight.

When cards have been made out for all of the cars of the train,the yard clerk attaches them to the particular car.It usually requires about 40 minuits for the train desk clerk to issue carding for a 60 car train.The cards are about three inches by five and the destination is printed in bold black or red ink,so as to be easily read at a distance.The foreman of the receiving yard engine now sets to work and it is worked into the intermediate yard,from which the cars are taken directly to the classification yard.

Commodities such as grain,commercial coal,fruits and live stock,on account of their differences in character must be handled in a manner peculiar to each.Our nex purpose will be to outline briefly,the manners in which they are handled on a large trunk line terminal.

The handling of Grains.

Owing to a state regulation,that all grain must be inspected and sampled by the State Grain Department,special provisinons must be made for the storage of the loaded cars,awaiting the sampling by the men of that office.Upon the arrival of a car of grain,it is carded for inspection,and a grain notice is made out from the information obtained from the waybill covering the car. The waybill is marked inspection and sent to the local agent office for future reference.The grain notice is handed to the sampler who puts it in the bag containing the sample and it later reaches the consignee's office along with the gradeing certificate.On the notice the name of the consignee,the car number and initial,the name of the consignor,the point of shipment and the contents.

Meanwhile the car has been assorted out and placed on tracks,used solely for the purpose of storing grain until final disposition has been received from the local agents office.All cars of grain that are received in the receiving yards after 9:30 A.M. are left over until the next day to be sampled.The length of time that a car is in the yard is,on the average,between the limits of I8 to 30 hours.This means from the exact time it reaches the yard until it leaves it.The tracks confined to the use of the storage of grain ladened cars,should be in a part of the yard,convenient to a station so that the inspector will have to carry the samples only a short distance.The capacity of the yard should be about I0% more than the total maximum day's business.Nothing other than grain should be stored on these tracks,except possibly in the dull seasons,when only a very few cars are received.

The next step is to get disposition for the car.As soon

as the inspector has graded the contents of the car,the broker is advised.The bill of lading,as well as orders for the final disposition of the car is then sent,by the brokers office,to the local agent's office.Usually the car is sent to one of the licensed elevators where the contents are weighed by Board of Trade weighmasters.Upon the receipt of the disposition,the agents office sends carding instructions to the outer yards and the cars are recarded for the proper movement.Unless there is a very unusually heavy grain movement the cars have been made up into the proper transfer trains by 2 A.M.

Coal Handling.

As heretofore stated the principal coal carrying trunk lines make special provisions for the handling of their commercial coal traffic.About 85% of the total number of cars of commercial coal are consigned to large wholesale dealers or,to large coal consumers,like the Commonwealth Edson Co.

The general rule,in regard to all cars of commercial coal,is to card the cars "hold" upon arrival.This is done regardless of the billing instructions,until disposition is received which is usually after the car arrives.This is done so that the consignee may divert the car at will upon the payment of the usual reconsignment fee.Firms like the City Fuel Co.have innumerable yards and it would be immpossible to know what yard the consignee wished to have the car go.Wholesale dealers sell the coal in a great many cases after the car has arrived at the outer yards,so this system gives them an opportunity to reconsign the car to its new destination.

In the local agent's office of the principal coal carry-

ing railroads,there is a special office in charge of the coal clerk.The duty of the coal clerk is to receive waybills from the outer yard offices,receiving the coal,secure disposition on all cars carded "hold"on arrival and to turn out carding for the same as soon as he has received it.He is expected to issue disposition, at the time he receives it from the consignees on expected shipments,to the train desks at the coal yard offices,so that the car may be properly disposed of on its arrival.Much time may be saved if the consignee would send out the disposition in advance of the cars arrival.

The practice of the Chicago,Milwaukee and St.Paul,in regard to the embargo system that they adopt,in regard to handling commercial coal has been explained elsewhere.In case a car is carded "hold "on arrival,a coal notice is made out and sent along with the waybill to the coal clerk at the downtown office,who sends a copy to the consignee.This notice is usually made out in duplicate and contains the following information:the exact time the car arrives,car number and initial,consignee,consignor,point of shipment,name of mine and the kind of coal the car contains,whether it is mine-run,6 inch lump,nut or screenings.

These are in the main the special provisions that have been put to use in the terminal offices of the principal carriers of grain and coal.While some of the details may differ,the essentials are about the same.

CHAPTER V.

CONCLUSION.

After all the plans and suggestions have been proposed and debated upon the fact still remains that Chicago is yet behind the times as regards its freight terminal facilities.Operating men from all over the country have turned their attention to the problem of reorganizing the freight terminal operation scheme of the Chicago terminal district.Many new plans of terminal operation are being brought forward and received with more or less favor.It has become quite evident that active measures must soon be adopted,or the increased cost of operation,with inadequate means, will eventually become almost prohibitive.One of the greatest drawbacks in revising the present system,is to design a general terminal scheme of operation that will be adequate for future needs.

The plan of building an outer belt line,to be run in connection with a system of general clearing yards,seems to be the the most advanced plan that has as yet been proposed.Most of the trunk lines that center in Chicago,are dubious about builing new terminal plants,until some definite plan has been agreed upon. The result is that they try to woory along under the present trying conditions.

"Red tape" as it is best known continues to exist,to a more or less extent,on all Chicago railroads, in the handling of certain classes of freight.This does not improve the service and so far as possible it should be eliminated.After all,the railroads are built for the service of the public and the sooner the officials realize the fact,the better it will be for all concerned. Cordial relation between the carrier and the shipping public should be preserved.The plan of organizing the terminal into a

well defined district is especially commended for the shipper then realizes that he can go to official and talk their differences over with each other.In addition this plan means a more intensely operated terminal.

The matter of freight house location should be improved so that the railways may better serve the shippin public.Approaches to the various freight houses and platforms should be widened and made more safe.Thereever possible tracks not used for the purpose of serving the m should be removed.Freight houses operated for the benefit of the road and its employees will lose business and the one that operates its freight houses for the service of the public will get the competitive traffic.Special provisions made for the reconsignment and release of the "hold " cars are recommended.

The slogan "keep the interchange traffic from the heart of the business district"will solve,to a very great degree, the time element and confusion that now exists.The plan of building the main yards at a point some 25 or 30 miles from the business district is endorsed by many leading authorities on railway operating matters.Until then it is predicted that the railways will suffer from operating inefficiency.

INDIANA HARBOR BELT RAILROAD COMPANY

JANUARY, 1912