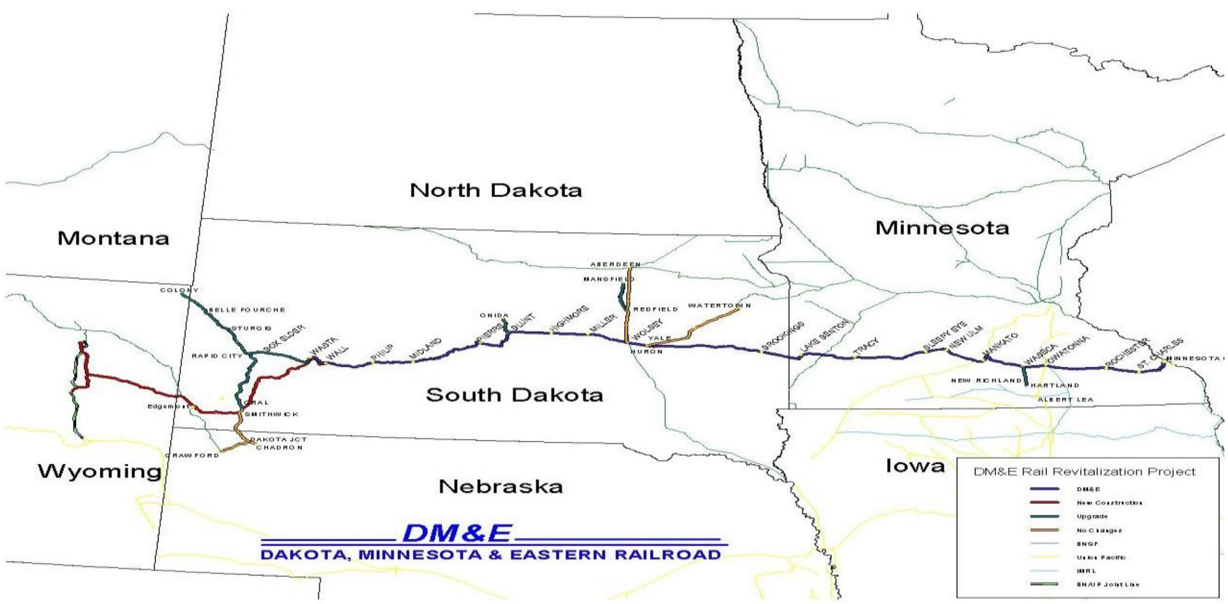


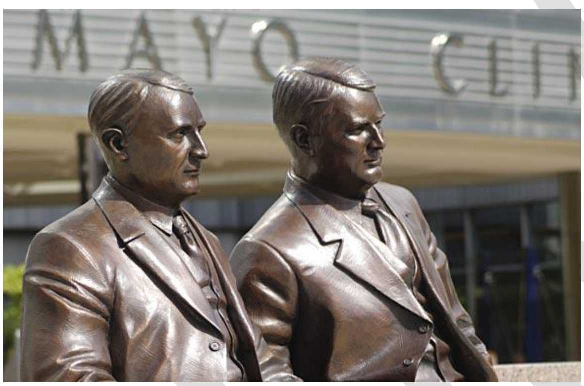
EXPANDED EXECUTIVE SUMMARY
CP/DM&E SOUTHERN RAIL CORRIDOR OF ROCHESTER, MINNESOTA
SUMBITTED TO: THE MAYO CLINIC MARCH 6th, 2009

Contents

EXPANDED EXECUTIVE SUMMARY

I OVERVIEW

Gannett Fleming Transit & Rail Systems (GFT&RS) was directed by the Mayo Clinic (Mayo) in cooperation with both the City of Rochester, Minnesota and Olmsted County, to prepare an up to date report documenting the effects of increased train traffic through the City of Rochester, in its current configuration and on an alternative alignment south of the city. This is in anticipation of a build-in to the Powder River Basin (PRB) coal mines in the State of Wyoming by the Canadian Pacific and Dakota, Minnesota & Eastern (CP/DM&E) railroads. This report discusses Task 3, which quantifies the operational effectiveness and cost of the Southern Rail Corridor alignment around the City of Rochester, while increasing the number of trains from the present number of three to 41 trains daily[1]. The present route through Rochester is in very close proximity to the Mayo's hospitals which can house nearly 34,000 patients, doctors, and staff at any given time. A derailment in this area such as the Minot, ND incident or the Graniteville, SC incident would have devastating consequences not only on the patients, doctors, and staff of the facility but on the ability of the community to be able to respond to the medical need required if such an incident were to occur. This Southern Rail Corridor route would traverse sparsely populated farmland and communities thus avoiding the heavily populated City of Rochester and its suburbs.



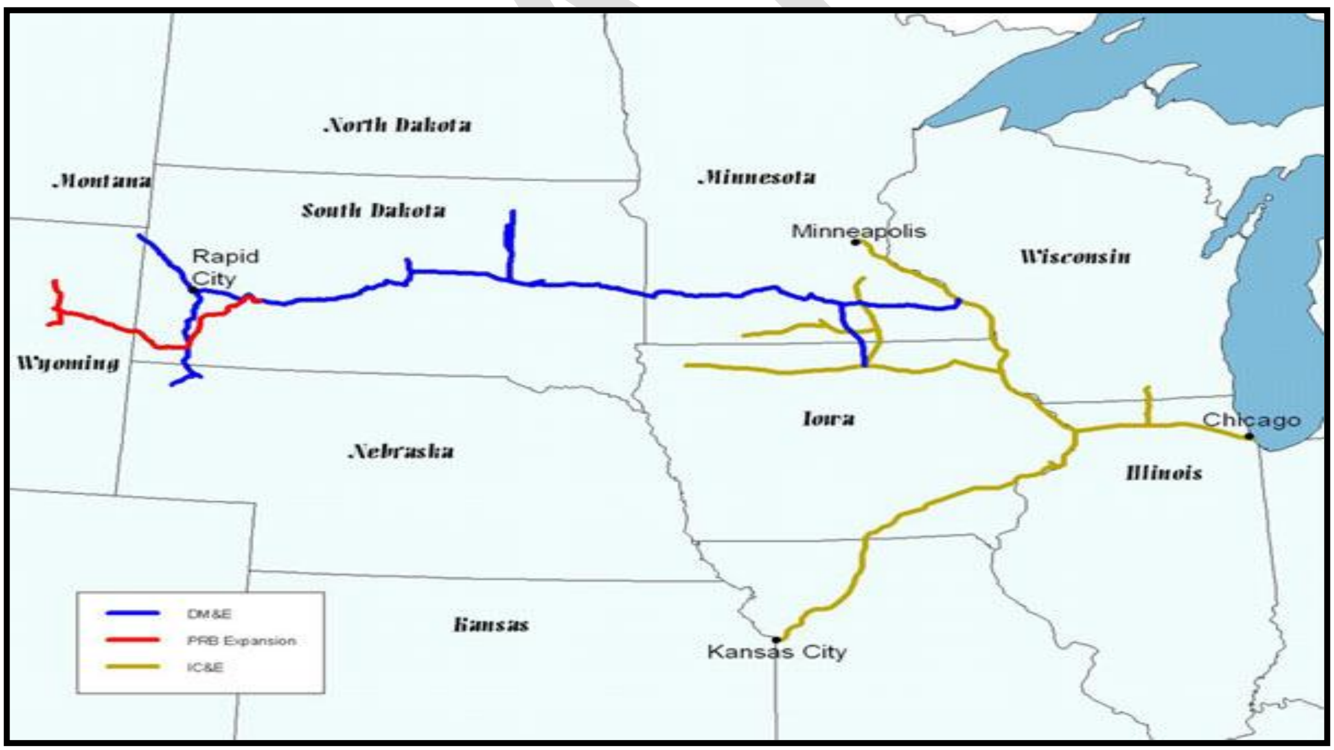
On February 20, 1998, the DM&E filed an application with the Surface Transportation Board to construct and operate 281 miles of new railroad into the Powder River Basin coal fields of Wyoming. In addition 598 miles of existing railroad through Minnesota, South Dakota and Wyoming would be significantly rehabilitated. Presently these coal fields are only served by two Class I carriers namely the Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) railroads. The intention of the DM&E is to increase its revenues and profitability by transporting coal from the PRB to coal fired utility companies located on their line and increase competition with the UP and BNSF for this service. DM&E would also use this increased revenue to upgrade other segments of its existing line to provide better and safer service to its existing customers. As a result, the number of trains along the existing DM&E corridor will significantly increase if the Powder River Basin Project is completed by the Canadian Pacific Railroad. Canadian Pacific was recently granted permission from the Surface Transportation Board to acquire DM&E. Current traffic consists of five to seven trains per day operating at slow speeds (some areas at 10 mph) including several switching movements. However, when the PRB project is completed, train traffic could increase to as many as 41

[1] In comments received from CP/DM&E they disputed the maximum number of trains proposed in the public documents stating the total number of coal trains through Rochester would be 24 to 28 daily on top of the existing 5 to 7 daily trains plus 1 to 2 weekly ethanol trains for a maximum daily number of 34 which is what we simulated.

daily trains operating at higher speeds consisting of 17 loaded coal trains, 17 empty coal trains, and 3 trains in each direction with other mixed commodities and potentially including unit trains of ethanol traffic, plus the existing Rochester local (refer to footnote one). CP also indicated that some of those trains could operate via other routes and not via Rochester.

Some of the largest coal reserves in the United States are located in the PRB region of Wyoming and Montana. This coal reserve is attractive because of its low cost of production and of its low sulfur content. In the 1970's, BNSF (formerly Burlington Northern) and Chicago Northwestern (purchased by Union Pacific) both built into these reserves. UP presently has access from the south while BNSF has access from the south, north and east. According to the FEIS, during the period from 1996 to 2006 demand for this coal increased by 59% from 204 million tons produced to 325 million tons produced respectively. According to present BNSF and UP marketing information, PRB coal production has increased an additional 7.5% from 2006 to the present with major increases projected through 2020 and beyond.

Originally access to this area was via single track operation for the two original carriers. Currently it is double tracked and about 60 miles of the area has been triple tracked. Further expansion is ongoing due to market projections and an increase in coal generated electricity. DM&E's shorter routes to existing markets make it a viable option to attract a vast amount of current and future market share.



Proposed Corridor

The proposed corridor for the CP/DM&E Southern Rail Corridor Alternative was developed to coincide with an abandoned Chicago Great Western (CGW) RR roadbed to the extent possible, taking into account physical restrictions such as I-90, where the old alignment meanders north and south of the interstate highway. The last CGW freight train on this abandoned line went through Rochester on March 5, 1965. That ended operations on the secondary mainline that extended between McIntire and Randolph, MN in kind of a north-south arc. Earlier (much earlier), the railroad wisely stopped trying to operate what was obviously a terrible route between Utica (on the C&NW east of Rochester and now on the DM&E) and Winona by a more northerly route than the existing DM&E.

Our objective in attempting to match the existing roadbed is to minimize potential geological hazards where soil and bedrock conditions could result in risks when constructing the track infrastructure above these sensitive areas such as fault lines, unstable slopes and sinkholes. Without a boring program, we assumed that the railroad conducted some type of subsurface investigation at the time the roadbed was originally constructed to avoid these sensitive areas. Of course new sinkholes have formed since the original construction effort.

The proposed Southern Rail Corridor is located in both Olmsted County and Dodge Counties, Minnesota, although the larger segment is in Olmsted County and traverses from Station 39+58 just west of Dover to Station 2592+ 99 just west of the Dodge Center for a total of 48.3 miles. The horizontal and vertical alignment was designed in accordance with AREMA and CARH Track Design Criteria, which was prepared for the PRB Project[2]. Horizontal curvature was restricted to a maximum of 2 degrees while the vertical alignment was restricted to maximum 1% grade or less. The proposed typical section represents a single track configuration with passing sidings and trackside swales located along both sides. A maintenance road paralleling the rail line was not included as part of our typical section to reduce right-of-way width. The objective of the Southern Rail Corridor is to provide a superior route that:

- avoids downtown Rochester;
- is practical to construct, operate and maintain for the anticipated traffic; and
- yields operating benefits to the railroad that make it sufficiently attractive to merit serious consideration.

It is recommended that key functional elements include the following – all of which have been reflected in the preliminary alignment design that has been engineered by Gannett Fleming:

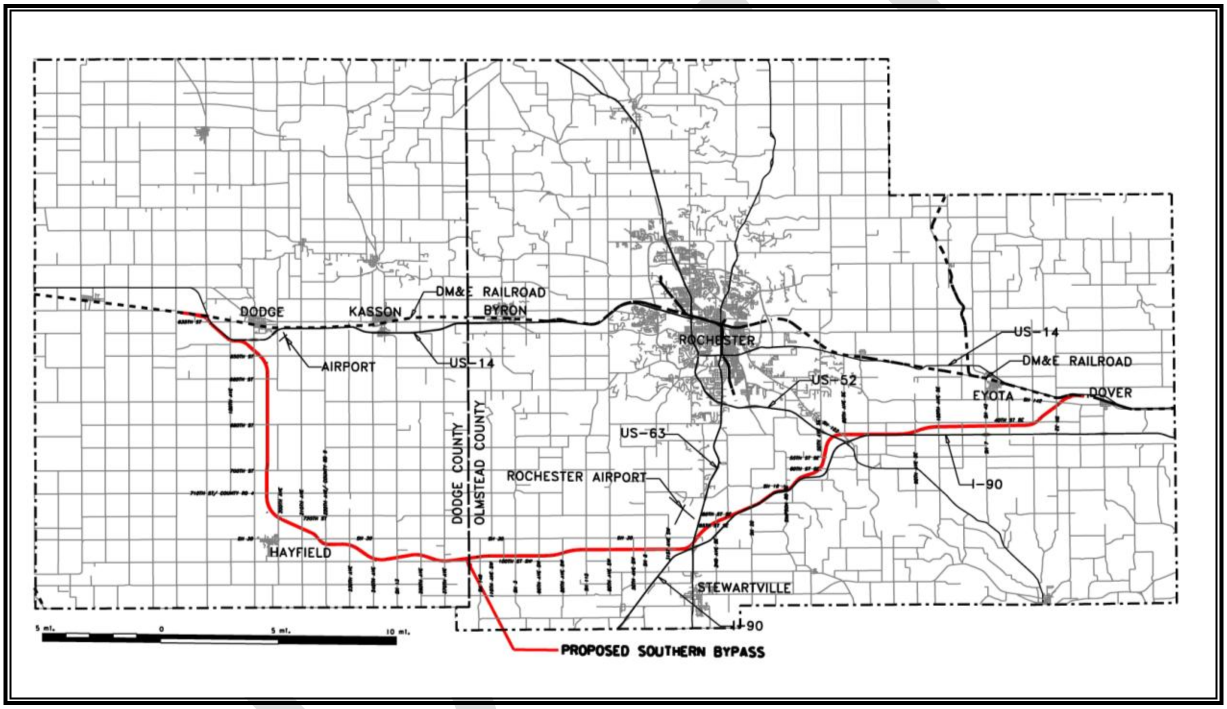
- Civil design to support operating speed of up to 60 mph;
- No significant speed restrictions;
- Maximum grade not to exceed 1% (one percent);

[2] We received DM&E engineering criteria very late in the report development. Their criterion does include AREMA. We used what criteria we could so as not to delay the delivery of the report. We do not believe the differences in criteria are extreme or will they change our opinion of cost.

- Signal system[3] for bi-directional traffic control and broken rail detection;
- Significantly greater capacity[4] than the existing alignment through Rochester;

A double track alignment was originally designed and simulated as the preferred system configuration based on the anticipated train capacity being projected to operate over the Southern Rail Corridor. Subsequently and based on technical review comments received from the CPR, a single track alignment with passing sidings was recommended as the build alternative, consistent with their current mainline configuration. As result, the design documents were modified to reflect the single track alternative.

In addition, an effort was made to maximize utilization of multiple segments of abandoned former Chicago Great Western R.R. grades where practicable and without violating functional requirements listed above.



Proposed Southern Rail Corridor Alignment

II CHALLENGES TO OVERCOME

[3] In comments received from CP if a signal system is installed it will be in compliance with the new Positive Train Control (PTC) legislation. This was initiated after our study began. CP provided us with some estimating information which indicated PTC would be less costly to install that what we designed. PTC is in very early stages of development which make it very hard to estimate at this time. The estimate contained herein is for the original design.

[4] We originally designed a double track alignment around Rochester. In comments from CP they indicated double track was not required therefore we re-designed the alignment as single track with five (5) passing sidings. This is reflected in our opinion of cost and our simulation results.

Several challenges present themselves to this project and careful consideration must be given to each. A comprehensive list of these challenges follows:

- Wetlands
- Protected Natural Areas and Parks
- Surface Waters
- Environmental Risk Sites
- Geological Conditions
- Right-of-Way Acquisitions
- Land Use
- Permitting
- Wind Mill Farms and other Utilities

All of these items are important to constructing the project with minimal impact to the surroundings. We believe that this can be accomplished. Careful consideration must be given to each item during final design so as not to overrun the projected cost estimate. Overall we believe the Southern Rail Corridor will have no serious impact on wetlands, protected natural areas and parks, surface water or environmental risk sites. Additional information on each item is contained in Appendix B at the end of this summary.

III CONSTRUCTION ELEMENTS

We have prepared a preliminary design close to the 30% level as a basis for our cost estimate and have taken into consideration design criteria from AREMA and criteria obtained from CP/DM&E. The track structure will consist of wood ties on ballasted track with 136RE continuous welded rail. Fasteners would be in accordance with CP/DM&E standards using cut spikes on double shoulder tie plates.

Both railroad and highway bridge structures will be required to construct this alignment. The project will require seven (7) railroad bridges and two (2) highway bridges. Various types of designs were considered to complete the alignment.

The proposed alignment will cross a total of 41 roadways at grade. We have recommended pre-cast concrete panels and state of the art constant warning time systems to protect both the motoring public and the railroad.

A Signal System will be required on this alignment to accommodate the number of trains projected for reasons of safety and capacity. We originally designed a conventional wayside signal system, however CP/DM&E have indicated that they would require a Positive Train Control System (PTC) in accordance with federal regulation this is currently being defined. While we anticipated this, it is very difficult to estimate based on the state of the current regulation (refer to footnote 3 on page 6).

Earthwork on this alignment is a major cost. We have attempted to balance cuts and fills while meeting the maximum 1% grade requirement, so we can use all available material. Several areas have bedrock close to the surface and will require blasting.

The design will provide for permanent erosion and sediment control where needed. This may include energy dissipaters, erosion pads, rip rap, flow dispersion structures and various other treatments to interface with the recommended drainage design.

We estimate that construction duration using a design-bid-build delivery system would be in the range of four and one-half years.

A more detail description of all of the construction elements can be found in Appendix C at the end of this summary.

IV OPERATIONS PLAN

No "Operating Plan" for future year traffic was received or available. Therefore, preparation of network simulation models for operations analysis required conjectural development of an "operating plan" based on four primary sources of information:

- Field observations of existing day-to-day train operations;
- Published materials in the public domain, including Dakota, Minnesota & Eastern – A Modern Granger Railroad by Cummings and Huddleston, South Platte Press, 2005;
- Materials submitted to the Surface Transportation Board (STB) by DM&E and/or Canadian Pacific Railway (CPR) and available for download from its official website.
- Limited guidance furnished by CPR including basic documentation of existing scheduled train operations.

Existing and Near-Term Operations

Recent DM&E train operations featured only a tri-weekly "overhead" freight train operating eastbound through Rochester on Sundays, Tuesdays and Thursdays and westbound on Mondays, Wednesdays and Fridays. In both directions, this train was scheduled to stop in Dodge Center for nominally one hour, from 1300 to 1400 (1 PM to 2 PM local time), to make pick-ups and set-offs that support the operation of the Rochester wayfreight and serve a large distributor of structural steel and steel products located in Dodge Center (plus seasonal agricultural shipments).

No information was received or available with regard to specific car types on these trains or the typical number of cars. Reliance was on field observations and materials available in the public domain. **In comments received from CP/DM&E they indicated that 5 to 7 daily trains operate on the existing track handling on the order of 5 to 6 MGT annually. This information was used in our simulations.**

Introduction of Unit Ethanol Trains

Later simulation stages all conjectured the introduction of a unit ethanol train consisting of forty (40) tank cars operating once every twenty-four hours in each direction, with the loaded direction being eastward. This is in recognition of the large ethanol plant at Brookings (one of the largest in the country) and other smaller facilities located on-line. These cars are currently being handled in the existing tri-weekly manifest freight train according to Gannett Fleming field observations. It was assumed that as traffic grows, the ethanol traffic could be shifted to a dedicated train. It was assumed that this pair of trains would be operated at a maximum speed of 40 mph, even if the track is further upgraded to support the operation of other trains at 60 mph. **In comments received from CP/DM&E they indicated that only one to one and one-half weekly unit train of ethanol is planned and will not operate until the present capital upgrades in Rochester are complete. This information was used in our simulations.**

Unit Coal Traffic

It was assumed that all of the proposed unit coal trains would consist of the same type and number of hopper cars, even though in practice the trains are likely to consist of whatever third-party (leased) cars are assigned to the service by the various utility or coal companies. Each loaded hopper car was assumed to contain a coal load weighing one hundred ten (110) tons. The tare weight of each car was assumed to be thirty-five (35) tons and the length of each car was assumed to be 57-1/2 feet over coupler pulling faces. **In comments received from CP/DM&E they indicated that the maximum train length would be 135 cars and that the maximum number of unit coal trains operating daily would be in the range of 24 to 28[5]. This information was used in our simulations.**

In all of the scenarios in which the main track was assumed to allow a maximum operating speed of 40 mph, three General Electric AC4400 locomotives were assigned to each unit coal train, all positioned at the front ("head end") of the train. In the case of empty westbound movements, one locomotive was assumed to be isolated to save fuel and the remaining two were assumed to be operating (generating traction power).

All coal trains in simulations that assumed main track upgraded to support 60mph operation were assigned a fourth identical locomotive that was positioned at the rear of the train. The

[5] In comments received from CP/DM&E they disputed the maximum number of trains proposed in the public documents stating the total number of coal trains through Rochester would be 24 to 28 daily on top of the existing 5 to 7 daily trains plus 1 to 1-1/2 weekly ethanol trains for a maximum daily number of 34. This information was used in the simulation results.

same configuration was maintained for empty westbound trains, but again one of the three locomotives positioned at the head end of the train was assumed to be isolated to save fuel. It was assumed that the single locomotive unit positioned at the rear of the train was always running. This type of operation featuring a remotely-controlled locomotive on the rear of the train – that stays with the train -- is similar to a scheme utilized by Canadian Pacific to operate certain trains over the demanding Selkirk grades on its trunk line across the Canadian Rockies west of Banff, Alberta.

V MODELING & SIMULATION

Network simulation modeling utilized a sophisticated, highly-specialized commercial software package called Rail Traffic Controller (RTC) by Berkeley Simulation Software of California. All five of the large U.S. "Class 1" railroads have licenses for this software and use it extensively for operations analysis (including "what if?" scenarios) and capacity planning. Among its features is a proprietary algorithm that dispatches trains and resolves movement conflicts along the network model that attempt to mimic decisions that real-world train dispatchers and locomotive (engine) crews would make.

In overview, three groups of simulations were developed:

- The first group focused on the existing "in town" route (former DM&E; prior to 1986 a secondary line of the Chicago & North Western R.R.).
- The second group added the proposed Rochester Southern Rail Corridor as a double-tracked physical plant and re-routed all of the proposed coal train traffic onto the Corridor. Thus, both routes existed in the models and operated simultaneously in simulation as a network.
- The third group revised the Southern Rail Corridor model to reflect a single-tracked configuration with five (5) controlled passing sidings each at least two miles long and spaced more-or-less equidistantly along the Southern Rail Corridor alignment to the extent the various constraints on horizontal alignment and vertical profile would allow. The in-town route remained as an integral part of the network.

The Southern Rail Corridor alignment was modeled in simulation with a two-block, three-aspect[6] wayside signal system in accordance with standards identified in the report. Even though the Canadian Pacific Railway (CPR) subsequently identified that it would not install such a system and would instead install or probably install Positive Train Control (PTC) – a new type of system that uses communication-based positioning technology to maintain safe train spacing -- a mechanism is required in simulation to maintain proper train spacing and to

[6] A three-aspect signal system supports "Clear" (Proceed), "Approach" (typically 30 mph but 25 mph on some railroads, prepared to stop at next signal) and "Stop" (or "Stop and Proceed", subject to conditions and operating Rules, as applicable).

process “meets” between opposing-direction trains at sidings and junction points. The described signal system was the most appropriate way to do this.

Public grade crossings were mimicked in all simulations with “sit” restrictions that cause trains to attempt to avoid blocking them while standing at (or anticipating) “Stop” signals or waiting for an opposing train to arrive at a designated meeting point.

- An obvious question is whether or not the reduction to the assumed maximum daily train movements identified during discussions with CPR (i.e., 28 unit coal trains instead of 34 and consisting of 135 cars instead of 100 cars and retaining only one unit ethanol train[7]) would have yielded an acceptable operation via the existing in-town route with maximized capacity improvements. The simulation results support the conclusion that this would still not be the case despite fewer weekly train-miles and fewer train conflicts. The assumed 35-car increase in the size of each coal train together with an assumed reduction of 6 coal trains per day (plus 1 fewer ethanol train) resulted in a “wash” with respect to train delay and a 20% increase in fuel consumption per train-mile in simulation. Average network velocity declined slightly because the heavier coal trains moved more slowly.

Table 1: Comparison of Network Simulation Results
Original and Revised Maximum Daily Traffic
Existing In-Town Route, One-Week Simulation

Stage	Run No.	No. of Conflict Resolution Trials	Avg. Velocity (mph)	Delay Pct.	Train Miles	Delay per 100 Train-Miles (mins.)	Delay Pct. Change from prior Stage	Train Miles Pct. Change from prior Stage	Est'd Fuel (gallons)	Fuel Gallons per Train-Mile
Original Traffic Assumption:										
9	1	859	23.959	42.52	8500.3	67.426	---	---	94183.3	11.1
	2	2,318	23.398	45.73	8409.7	72.885	---	---	93263.3	11.1
	3	618	23.294	46.48	8455.0	74.256	---	---	93315.0	11.0
	Avg. >	1,265	**23.550**	44.91	**8455.0**	**71.522**	**---**	**---**	93587.2	**11.1**
Revised Traffic Assumption:										
9-R	1	418	23.049	34.26	6902.4	58.809	-12.8%	-18.8%	91868.7	13.3
	2	942	21.114	48.51	6947.1	83.204	14.2%	-17.4%	92244.0	13.3
	3	840	21.809	42.97	6947.1	74.122	-0.2%	-17.8%	91988.2	13.2
	Avg. >	733	**21.991**	41.91	**6932.2**	**72.045**	**0.7%**	**-18.0%**	92033.6	**13.3**

[7] Since the specific day of the week when the lone unit ethanol train would operate was not provided, and would have less impact if operated on a “slow” traffic day, one westbound (empty) unit ethanol train was operated in simulation each “day”. This maintained the correct worst-case daily train total but exaggerated the weekly train movement total by 4 trains (metrics were computed for a 5-day week). Given a stated volume of “1.5” unit ethanol trains per week it is unlikely that two such trains would operate on the same day absent unusual circumstances.

The Task 3 ("Corridor") alignment featured a superior horizontal alignment and vertical profile compared to the existing railroad through Rochester. We initially populated the model with an identical train Operating Plan as was used in the Task 2 analysis and described in that report. The Corridor alignment handled all of the trains simulated with superior results. Our first pass was with a maximum authorized speed ("MAS") of 60 mph. We then evaluated the operation at 40 mph to consider the effects of fuel savings and found that at 40 mph the Corridor alignment is still superior to the in-town route while offering fuel economy at the slower operating speed. Sixty miles-per-hour is considered aggressive for coal trains.

Network simulation results indicated that a seamlessly double-tracked Corridor route – if constructed substantially as designed -- could be traversed more quickly than the route via downtown Rochester by every train that used it, even if the existing ("in town") route were substantially upgraded. This is due higher average operating speed and no delays via the Corridor except where it joins the existing single-track rail line at its eastern and western endpoints.

If, instead, the Corridor is constructed as a single-track railroad with passing sidings, transit time for an individual train would depend on the quantity and timing of opposing traffic during the time when any given trip over the Corridor is actually underway. Analysis of the simulation results with revised maximum daily traffic of 28 coal trains revealed that twenty-two (22) coal trains traversed the Corridor in simulation with no delays over a two-day sample period – in other words, roughly 40% of the train movements or two out of five. The delay caused by waiting for an opposing train movement at a siding can vary greatly, but because no switching operations are anticipated along the Corridor the wait will vary from almost zero (if the opposing train has already arrived at the meeting point) to roughly twenty-five minutes if all five sidings are constructed (or are incrementally constructed consistent with traffic growth).[8]

- Three key contributors to train delay via the existing in-town route through Rochester would be avoided or mitigated via the Southern Rail Corridor:

    1. Lower average speed due to speed restrictions within the City of Rochester, even with track improvements;

    2. Delays due to local switching operations and meets with other trains;

    3. A more uniform vertical profile, whereas the existing in-town route presents some locally significant grades -- especially eastbound between Rochester and Chester ("Haverhill") that would be adverse to eastbound (loaded) coal trains.

An important observation is that the effect of the proposed Southern Rail Corridor on train delays is very dramatic (compared with the in-town route) if constructed and operated as a bi-directional, double-tracked line. When operated at 40 mph maximum speed in simulation

[8] With sidings nominally 8 miles apart, assuming an average speed of 30 mph this distance requires 20 minutes to traverse, plus the length of the train assumed to be 8,055 feet (an additional 3 minutes). Rounding up to reflect everyday variability in heavy unit coal train performance yields 25 minutes for planning purposes.

(which foregoes a small train-delay advantage realized at 60 mph MAS), train delay minutes per 100 train miles fell 78.8% (to 15.15 from 71.52) even though train-miles over the five-day statistical simulation period increased 17% (from 8,455 to 9,899).

When the daily traffic volume was revised as described previously and no changes were made to the Southern Rail Corridor infrastructure assumptions (i.e., still double-tracked), train delays in simulation fell by one-third (33%) even though weekly train-miles in simulation were just 18% fewer than before. Gallons of diesel fuel consumed per train-mile increased by 1.6 (16%) because each coal train was 35% heavier. Average network velocity slowed slightly (to 25.5 mph from 26.4 mph) for the same reason. (Compare **Stage 12** results with **Stage12-R** in **Table 2**.)

It is important to note that all three simulation scenarios detailed below assumed exactly the same assignment of locomotives. That is, despite increasing each coal train from 100 to 135 cars, the number of locomotives assigned to each such train (four General Electric AC4400 units) was held constant. It was assumed that one locomotive unit was in 'idle' mode when operating westbound assigned to an empty hopper train.

Table 2: Comparison of Network Simulation Results
Original and Revised Maximum Daily Traffic
Proposed Southern Rail Corridor Route, One-Week Simulation

Stage	Run No.	No. of Conflict Resolution Trials	Avg. Velocity (mph)	Delay Pct.	Train Miles	Delay per 100 Train-Miles (mins.)	Delay Pct. Change from prior Stage	Train Miles Pct. Change from prior Stage	Est'd Fuel (gallons)	Fuel Gallons per Train-Mile
Original Traffic Assumption, Double-Track Corridor:										
12	1	192	26.811	6.16	9953.5	11.832	---	---	99350.3	10.0
	2	161	25.779	10.65	9844.5	20.452	---	---	98866.2	10.0
	3	129	26.656	6.87	9899.1	13.164	---	---	98600.2	10.0
	Avg. >	161	**26.415**	7.89	**9899.0**	**15.149**	**---**	**---**	98938.9	10.0
Revised Traffic Assumption, Double-Track Corridor:										
12-R	1	114	25.310	5.85	8042.9	11.718	-1.0%	-19.2%	93697.6	11.6
	2	87	25.404	5.38	8096.8	10.812	-47.1%	-17.8%	93969.2	11.6
	3	99	25.747	3.87	8096.8	7.755	-41.1%	-18.2%	94099.7	11.6
	Avg. >	100	**25.487**	5.03	**8078.8**	**10.095**	**-33.4%**	**-18.4%**	93922.2	11.6
Revised Traffic Assumption, Single-Track Corridor with Five Passing Sidings:										
12-R PS5	1	275	23.076	18.29	8052.0	36.312	209.9%	0.1%	92895.6	11.5
	2	224	23.153	17.96	8105.9	35.682	230.0%	0.1%	92978.8	11.5
	3	233	23.308	16.77	8052.0	33.326	329.7%	-0.6%	92822.6	11.5
	Avg. >	244	**23.179**	17.67	**8070.0**	**35.107**	**247.8%**	**-0.1%**	92899.0	11.5

The third data set (**Stage 12-R-PS5** in the referenced **Table 2**) describes the quantitative results of converting the double-tracked Corridor model to single-track with five controlled[9] passing sidings. It was assumed that each siding would be equipped with #20 turnouts capable of supporting a merging/diverging speed of 40 mph and would be at least two miles long between clearance points. (See **Appendix A** for a list with specific Stationing and Mile Post limits for each siding.)

- Despite no change in the number of weekly train-miles operated, train delay assuming a single-tracked Corridor with five sidings increased 3-1/2 times to 35.1 minutes per 100 train-miles under the revised traffic assumption. This was 132% or about 2-1/3 times the outstanding train delay results obtained with the original traffic assumption operated on 100% double-track. Estimated fuel consumption was essentially unchanged (actually 0.1 gallons per train-mile or 0.86% more favorable, perhaps due to slightly slower average operating speeds).

However, compared to the metrics presented in **Table 1** for the same traffic scenarios on the in-town route, the simulations predicted train delay via the Corridor (with five sidings) of roughly *one-half* that of the in-town route (35 minutes compared with 72 minutes per 100 train-miles operated). Network velocity was slightly improved via the Corridor (23 mph compared with 22 mph). Fuel economy per train-mile operated was significantly better: 11.5 gallons per train mile compared with 13.3 yielding a 13.5% improvement in favor of the Corridor. Of course, the number of weekly train-miles operated in simulation increased from 6,932 (via the in-town route) to 8,070 because of the unavoidably longer distance traveled by each train that operated via the Corridor. Taken as a stand-alone metric, 35 minutes of train delay per 100 train-miles operated (or 21 seconds per mile per train on average) is indicative of a busy but operationally stable network that could recover fairly quickly from minor delays and everyday variations in operating conditions.

- Although a single-tracked Corridor with passing sidings cannot yield operating metrics that are as robust as a double-tracked line, both scenarios yielded fluid train operations in simulation and can clearly support the anticipated traffic. Moreover, although all five sidings would logically be anticipated by grading and associated structures such as bridges and culverts, they could be constructed incrementally in step with traffic growth.

- Train delay results for all Southern Rail Corridor scenarios were materially superior to simulation results for the in-town route given the same traffic assumption. The lone exception to this finding was a single-tracked Southern Rail Corridor model with no sidings whatsoever that could handle traffic operating in only one direction.

- Overall fuel consumption comparisons (not gallons per train-mile) with the more direct in-town route are predicted to be less disadvantageous (more convergent) with a single-tracked Southern Rail Corridor route with passing sidings instead of a seamlessly

[9] "Controlled" means operated by a train dispatcher or block operator – almost always located at a remote office site. It is used to distinguish such facilities from "hand operated" sidings that require a member of a train crew or some other on-site employee to manually operate the track switches.

double-tracked line. This is doubtless because of slightly lower average train speeds, so long as the resultant fuel savings are not sabotaged by excessive delays (starting, accelerating, braking and stopping/standing). Because each loaded coal train would have a mass of roughly 20,000 tons, the amount of energy (diesel fuel) saved by operating at more moderate speeds is more significant than what the small difference in average speed might suggest.

On point, the simulation results presented so far indicate that a single-tracked Corridor with five sidings would be adequate (and superior to the in-town route from an operating standpoint) but are inconclusive as to whether or not such an infrastructure model is in excess of requirements. Accordingly, two of the passing sidings along the Corridor model were shut down (disabled, taken out-of-service) and the same (revised) traffic scenario of 28 daily coal trains was re-dispatched. Train delay per 100 train-miles and delay percentage both jumped by 49% with identical train-miles operated. Network velocity fell slightly from 23.1 to 21.7 mph. Predicted fuel consumption fell very slightly. In particular, the substantial increase in network train delay indicates that all five sidings are necessary to support fluid operations under maximum traffic.

Modeling and Simulation Conclusions

A set of computer rail network simulations based on assumptions that are consistent with accepted industry practices, plus field observations, guidance furnished by Canadian Pacific Railway and publicly-available documents has identified the following:

- The existing railroad has some unsubscribed capacity that is available immediately. A modest increase in train traffic whether phased-in over a period of time or even "overnight" will have little effect on operating efficiency. This observation however *does not* extend to possible degradation of the existing track structure resulting from additional train traffic and/or heavier axle loads.

- Reasonable infrastructure improvements implemented over a period of time and likely to be constructible within the existing railroad right-of-way will support additional moderate increases in train traffic, including the introduction of a small number of daily unit coal trains. With main track upgraded to support freight train operation at up to 40 mph, three controlled passing sidings of suitable length to contain these trains, a wayside block signal system (or equivalent) and centralized dispatching with power switches at siding limits, at least four (4) daily coal trains (two in each direction) could readily be supported.

- Further upgrading to support 60 mph operation (including – importantly -- raising the maximum speed through Rochester from 10 mph to 30 mph) could support significantly more coal train traffic, up to a range estimated to be at least nine (9) but less than thirteen (13) coal trains in each direction every 24-hours.

- All of the assumed improvements in combination were not sufficient to support fluid train operations through the study area via the in-town route at the assumed maximum level of coal train traffic of twenty-eight (28) daily trains (14 in each direction) – much less 34 -- plus an assumed increase in manifest (general freight) train traffic to two each way daily, plus an occasional unit ethanol train and the Rochester Local. This includes all of the capacity improvements identified in FEIS Appendix J, "Alternative B" consisting of 20.2 miles of new passing sidings and second main track within the study area. Moreover, a proposed 6.6-mile second main track through Kasson was found to have questionable value compared with alternatives such as extending the existing Dodge Center siding.

- Construction and operation of the proposed Corridor as a single-track railroad operated in one direction only and with no passing or overtake facilities was found to be roughly comparable to the maximum buildout capacity improvements proposed by the DM&E in November 2001. That is, it would alleviate the need to make capacity improvements on the existing railroad through Rochester except at Dodge Center but would only modestly reduce train delays (by about 8%).

- Construction and operation of the proposed Corridor as a double-tracked railroad (except at its two junction points with the existing DM&E line) – or as a single-track line with adequate passing siding facilities -- was shown to dramatically reduce train delays, even if operated at 40 mph maximum line speed instead of 60 mph in order to conserve fuel. If built, it would allow the railroad to forego all capacity improvements on the existing DM&E between roughly Mile Post 33 and Mile Post 72 with the exception of the Dodge Center passing siding as a manually-operated facility (to accommodate the remaining traffic including increased train lengths).

VI COST ESTIMATE

The cost estimate that is presented in this report is order of magnitude and conceptual in basis. It includes construction of the railroad infrastructure as described in the report which is a single track mainline with five passing sidings each approximately two miles long. The cost was determined using unit prices and available quantities we have identified in the available material. Our opinion of cost is approximately **$325,000,000**.

VII CONCLUSIONS

We believe that a very operationally effective Southern Rail Corridor alignment (single track with five passing sidings) around the City of Rochester can be constructed if the right-of-way can be acquired. It is important to note that the Corridor alignment modeled in simulation was prepared as a thorough but preliminary engineering effort which included comments from CP/DM&E. Given the significant ongoing implications for fuel consumption, and therefore direct operating expense, it is expected that a continuing engineering design effort would examine the possibility of moderating some of the steeper (1%) gradients on the alignment in an attempt to further optimize train operations by accepting additional construction cost in exchange for lower ongoing operating expenses. It would also be logical to examine each anticipated grade crossing to determine if it could be economically grade-separated (or even closed) and to experiment with different locomotive assignments in simulation in order to identify the optimal trade-off between acceptable train delays and fuel economy.

In as much as construction of the Corridor route around the City of Rochester would result in changes to the lay of the land, assuming that sufficient right-of-way can be acquired to build the alignment, we do not see an extremely significant impact on the existing topography. We evaluated environmental and geological concerns that have been previously discussed and some that we discovered. However, we do not believe there are any situations that exist that are insurmountable in nature. In our report we present, discuss and offer solutions to the karst issues previously discussed in the STB's FEIS. We also present, discuss and offer mitigation solutions to environmental issues that will be encountered. Overall we believe the Corridor will have no serious impact on wetlands, protected natural areas and parks, surface water or environmental risk sites.

Construction and operation of the proposed Corridor as a single track railroad with five passing sidings was shown to reduce train delays, even if operated at 40 mph maximum line speed instead of 60 mph in order to conserve fuel. If built, it would allow the railroad to forego all capacity improvements on the existing DM&E between roughly Mile Post 33 and Mile Post 72 with the exception of lengthening the Dodge Center passing siding as a manually-operated ("hand operated") facility (to accommodate the remaining traffic including increased train lengths)[10].

In summary, geological and environmental concerns will be encountered but can be mitigated. Cost for the construction of the Southern Rail Corridor will be greater than that for the in town mitigation, but could in time be overcome because of lower operating costs and fuel efficiency. Safety through the City of Rochester will be greatly improved because of decreased operations in a highly populated metropolitan area.

[10] It should be noted that CP/DM&E have already started their 2009 capital program which include the replacement of rail, switches, and portions of ties and ballast. This is projected to be in the range of 16 to 18 million dollars.